

The Iron Age

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The Ridgway Direct-Acting Cranes.

The accompanying engravings show some of the arrangements and applications of a very simple form of crane turned out by Messrs. Craig Ridgway & Son, of Coatesville, Pa. The crane is striking on account of its simplicity and low cost, and its adaptability to all places where it is desirable to handle heavy weights cheaply and rapidly. It consists of a cylinder whose lower end is closed, while the upper end is open. The piston-rod terminates outside of the cylinder in a suitable eye, to which grappels or chains are attached. The cylinder is hung upon gimbals and mounted upon a frictionless truck, which travels backward and forward upon the jibs of an ordinary foundry crane. This crane is framed in a simple manner of iron or wood, as may be preferred. The gudgeons of the crane are made hollow. Through the top gudgeon a steam-pipe is led to a suitable valve arrangement. From this valve one pipe leads down through the bottom gudgeon, while another passes up to the jibs of the crane. The end of this latter pipe is connected to the lower end of the cylinder by a flexible pipe or a short section of steam hose. This flexible pipe permits the cylinder to travel in and out upon the jib, and thus control all the floor space covered by the radius of the crane.

To operate the crane the weight is attached to grappels on the piston-rod and steam is admitted under the piston. The weight is immediately raised and may be swung to any desired point. To lower the weight the steam in the cylinder is exhausted through the bottom gudgeon. The work is under full control of the operator at the valve. Fig. 1 represents a blast-furnace derrick crane, and Fig. 2 as used in wire works over the annealing pots. In adopting their crane for the use of blast furnaces in handling hot cinders, Messrs. Ridgway have found it desirable to transform it into an hydraulic crane. In this case, instead of bringing steam in through the top gudgeon, they place in the ground, in close proximity to the crane, a second cylinder of somewhat larger capacity than the lifting cylinder hung upon the jibs. A pipe passes from the bottom of the ground cylinder up through the bottom gudgeon of the crane, and is carried through a swivel stuffing-box in the post and up to the jibs of the crane, where it is connected to the lifting cylinder by a flexible pipe as before. The upper end of the ground cylinder is closed and has a steam-pipe and an exhaust-pipe, controlled by suitable valves entering it. The cylinder is filled with water. To operate the crane steam is admitted on top of the water, forcing it through the pipe leading to the lifting cylinder, where it raises the weight. The lifting speed is controlled entirely by the size of the pipe connecting the two cylinders. To lower, the steam is exhausted from the ground cylinder and the water flows back, due to gravity, and the same water is used over and over again. Quite a number of these cranes are in use, their simplicity, durability and low cost having secured a most favorable reception for them.

The Bull Rock Lighthouse.

About 20 miles west of Castle-town Berehaven, Ireland, lately selected as a station for the British navy, lies the Bull Rock, and 3 miles to the northwest is situated the Bull, where the Government are at present erecting a lighthouse to replace that of the Bull Rock, which was swept away in the great storm three years ago. A steamer belonging to the Board of Lights conveys the workmen from Castle-town to the Bull Rock, but so dangerous is the approach in consequence of the swift currents which prevail here, and which make the rock, even in the calmest weather, a very Scylla to modern navigators, that ordinary visitors are forbidden by a board order from essaying the dangerous passage. By driving from Castle-town to Durrus Sound, a journey of about 15 miles, one may get a good idea of the boon the light will prove to storm-tossed mariners, by observing the inhospitable nature of the coast of which it is to serve as a beacon. The coast presents to the seaside a precipitous rocky wall, worn into strange shapes by the action of wind and wave, and broken occasionally by deep, narrow gorges or bays, studded with rock islands. Three rocks—the Bull, Cow and Calf—lie off Durrus Head, the Bull situated at a distance of 3 miles to the northwest. The rock rises more than 300 feet above the sea, and is pierced through from side to side by an immense natural cavern. This year will be wholly occupied in constructing

steps and cutting barracks in the solid rock to house the workmen. Next year a chamber will be excavated in the summit, from which the top of the lantern will rise above the rock, so that the light will send out its beams from a height of more than 300 feet above the surface of the sea.

The Lake Superior Ore Districts.

A correspondent of the Pittsburgh Chronicle-Telegraph, writing from Marquette, Mich.,

ern—through to that point by November 1. Some of the ore will likely be shipped from the mines there this fall, to allow of furnace tests being made for next season's delivery, but the quantity of Agogeebic ore sent forward this year cannot amount to more than a cargo or two, as the shipping season will close shortly after the date fixed for the railroad to strike the lakes. Those interested in the new field intend to make a good showing next season, however, and your correspondent sees no reason why that district should not be heard from loudly next year,

were maintained by making heavy concessions to furnace owners, and thereby making it an object for the latter to use these ores, though the grade of iron produced was not at all equal to what they could obtain by using the Lake Superior ores.

American Products in Chili.—Circulars containing the announcement of a permanent exhibition of American manufactures and machinery, to be held at Santiago by the Chilean Government, are being dis-

The Charcoal Iron Industry.

The August number of the *Journal* of the United States Association of Charcoal Iron Workers contained an article on the "Present Condition of the Charcoal Iron Industry," a part of which we reprint:

Grades of any commodity which command special trade by reason of peculiarities of manufacture, or on account of well-defined adaptation to specific uses, are always most sensitive to market fluctuations, and very often lead these commercial changes. As charcoal pig iron or blooms generally come under the head of such special manufactures, it is not surprising that in the present depressed times those who produce charcoal iron should draw dark pictures of the future and become profits of evil against themselves, because the proportionate decline has been greater in their specialty than in many others. So severe has been the blow which has lately fallen on this industry that some of its former ardent champions have predicted its early extinction. We have no faith and but little patience in such statements, for as long as the great wastes of the lumber industry continue, as long as tan-bark is stripped, as long as railroad sills or telegraph poles are cut, or as long as no general system of reforestation is adopted and enforced over the entire nation, there will be ample waste wood to make charcoal sufficient to smelt millions of tons of pig iron annually. The problem is, shall this waste be allowed to rot in the woods and form nuclei for ravaging forest fires, or shall it be converted into fuel which has no superior for smelting iron ores in the blast furnace.

Of the timber matured and approaching maturity there is much which, owing to want of proper care, will be fit for nothing but fuel; but we do not hesitate to recognize the fact that much of the wood now cut for making charcoal would be useful for other purposes; the quantity, however, bears a very small relation to that wasted in manufacturing, &c., and which would make good charcoal. We believe that if a judicious plan of collecting the wood and improved methods of carbonization were employed, charcoal pig iron can be made to-day as cheap as iron smelted with mineral fuel from the same ores at either Chicago, Milwaukee, Detroit, Cleveland, Buffalo, New York, Philadelphia or Baltimore. A judicious selection from timber now wasted, an equipment of light railroad, such as was described in *Journal*, Vol. V, p. 177, and a system of water transportation from termini of railroads, would deliver wood from considerable distances at any of the above-mentioned cities at figures which will permit of economic operation if improved methods of carbonization and collecting the acetic vapors are adopted. Yet, while it is possible to make charcoal pig iron competitively at points where water transportation is to be had, there will, undoubtedly, be numerous cases where existing iron works, some hoary with age, or landmarks of long standing, will never be active again. The charcoal iron industry will live as long as it keeps pace with advances in other branches of metallurgy, but it has passed the time when any talismanic value is connected with the word charcoal. Carelessness in detail in some furnaces using mineral fuel, and conscientious adherence to certain ores by many charcoal ironworkers, made the word charcoal synonymous with superior, and as long as this synonym is sustained, so long will the merit of charcoal iron be appreciated.

It is not to be expected that financial success will attend ventures such as are attempted by some works; we know of cases where wood is cut from land worth \$75 to \$100 per acre, when cleared, but is allowed to grow up in forests, and about 30 cords per acre are cut. This wood is all coaled in millers, and not more than 30 bushels of charcoal per cord are obtained. While under these circumstances the retention of the property in timber may be judicious as affecting the forestal condition of a certain district, it needs no intricate calculation to show that the cost of wood to form a bushel of charcoal is as great as the cost of charcoal should be under more favorable circumstances. We lately had called to our attention a locality where wood-leave and wood-chopping aggregated 7 cents per bushel of charcoal made. To this 7 cents must be added the cost of carbonizing in millers, and hauling the coal to works, with allowances for loss in handling, &c., and it is not to be pre-

(Continued on page 5.)

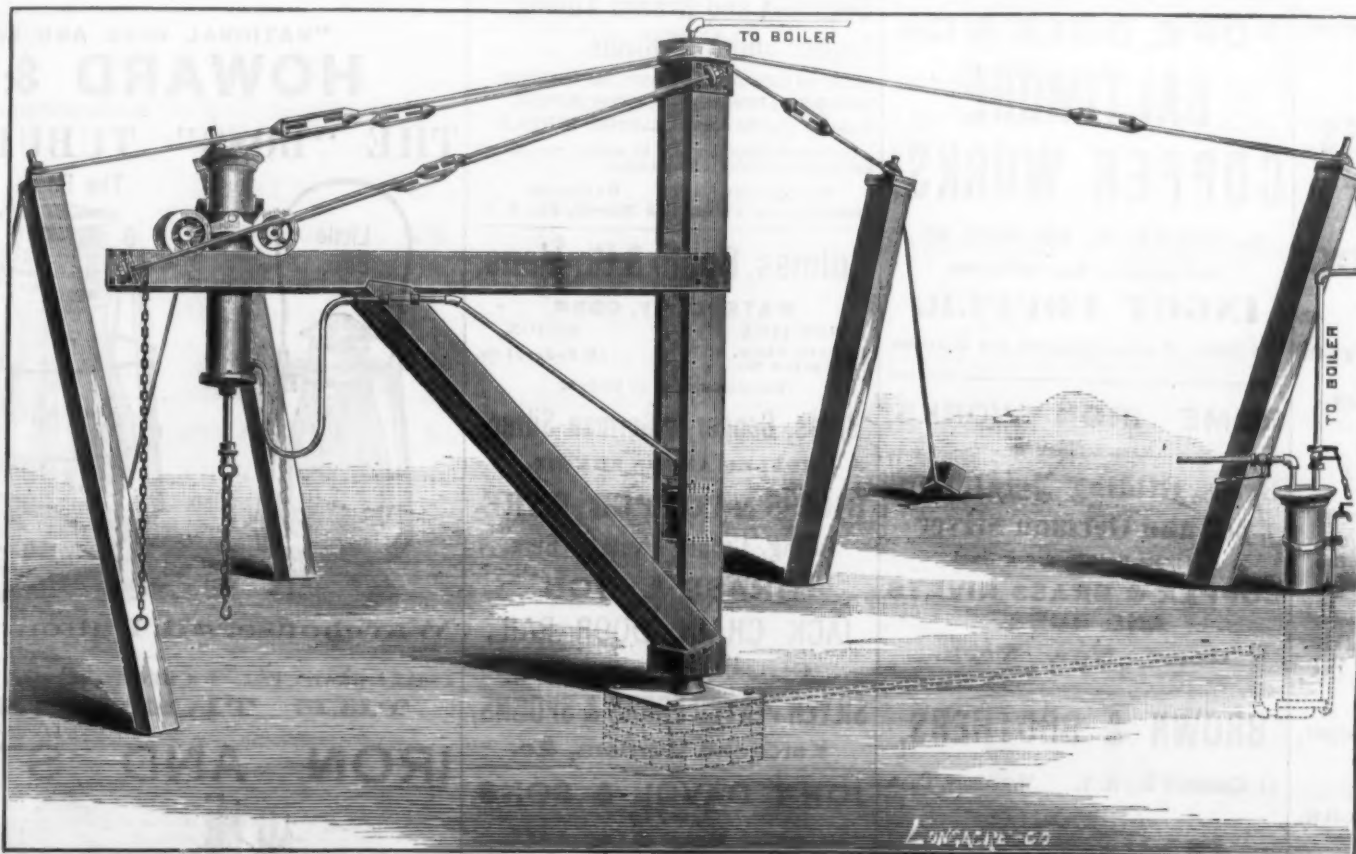


Fig. 1.—Blast Furnace Derrick Crane.

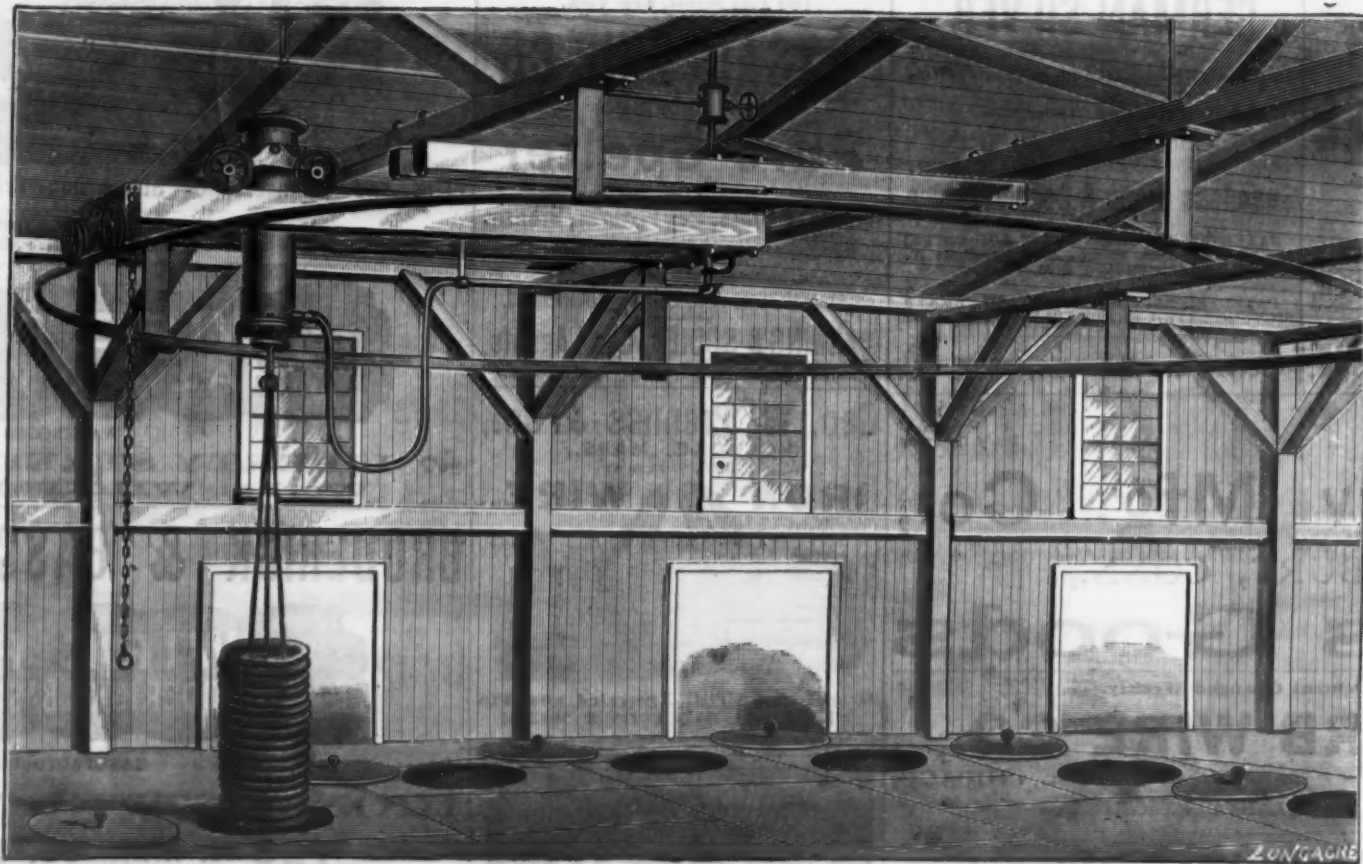


Fig. 2.—Crane for Annealing Pots in Wire Works.

DIRECT-ACTING CRANES, MANUFACTURED BY CRAIG RIDGWAY & SON, COATESVILLE, PA.

after describing the work accomplished this season on the Marquette and Menominee ranges, says: "A third district that gives promise of becoming an important producer will be opened up on the south shore of Lake Superior before the shipping season of 1884 comes to a close, probably. This is the Lake Agogeebic range, where numerous iron properties have been developed to such an extent that they will be prepared to ship ore as soon as the railroad tapping that district reaches Ashland, which is to be made the shipping port for the Agogeebic mines. Ore docks are in course of construction at Ashland, and the contractors expect to have the road—the Milwaukee, Lake Shore and West-

as there is plenty of ore there, and much of it is of fine quality."

With reference to the future, the writer evidently has very great faith in the advantages of the Lake Superior region, for he predicts: "The iron fields lying south and west of Lake Superior, in this State, Wisconsin (part of the so-called Agogeebic mines are in the latter State) and Minnesota are destined soon to furnish a vastly enhanced quantity of the very best ores in the world. Not only this, but they will place their ores on the market at prices that must necessarily drive out the inferior ores of certain competing fields, which were able to find sale for their product while high prices

tributed. It is the intention of Chili to conveniently arrange a part of the National Exposition Building at Santiago in order that American manufacturers may exhibit their productions. All goods thus sent are admitted free of duties at the custom house in Valparaiso, and become the property of the Government from the time their invoices and bills of lading are delivered to the consul. The Chilean Government pays the expenses for landing goods, and for their transportation as well as their care while there. No definite time or duration for the exposition has been fixed. The Chilean Government reserves the right of terminating it after two years' notice.

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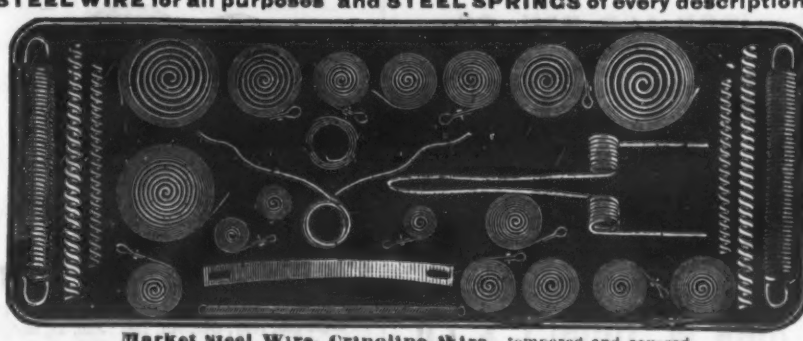
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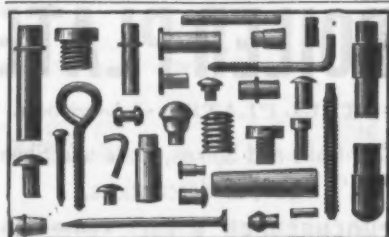
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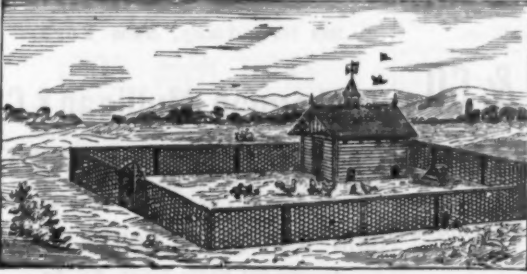
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480 Walnut St., PHILADELPHIA, PA.

(Continued from page 1.)
sumed that such a plant could be operated
successfully in depressed times. There are
other works which pursue the most approved
methods in their practice in smelting ores,
producing charcoal, &c., and are able to keep
ahead even with the low prices ruling. We
do not say that these works are earning a
fair return; we do not think they are, for
we have always felt that an investor was
entitled to the advantages due to his location,
whether they be natural or artificial, dis-
covered by exploitation, discerned by busi-
ness foresight, or developed by outside
causes. Besides this, one who invests in
iron manufacture, with all its attendant risks
of dull trade, large stocks of raw materials,
business failures, fires (a considerable item,
particularly to the charcoal ironworker)
labor troubles, &c., is entitled to more than
legal interest on his capital, in addition to
such advantages of location as nature has
given him, or his pluck has developed. There
are some plants idle to-day which, we believe,
could be operated at a profit on present
quotations, and others are active which do
not seem to possess any special advantages;
but, generally speaking, the charcoal iron
trade is remarkably quiet, with but little
immediate cause for encouragement.

We have frequently asserted, and we
firmly believe, that the iron trade of the
United States is sufficiently sensitive to care
for itself, and that, practically, its only dis-
turbance is importations of foreign iron
and steel. We manufacture or produce
little, if any, more than our country consumes,
but the annual statements of stocks in
makers' hands bear a surprisingly close rela-
tion to the annual amount of iron imported.
Cheap railroad transportation has lately
somewhat changed the status of the various
iron-producing districts, and the furnaces
near the Atlantic seaboard have found
competition with their own product in what
they considered "home markets." Some of
this metal has been transported at rates
upon which there appears no possible margin
of profit for the carrier; but a railroad
which delivers to furnaces the raw material
at profitable rates may well afford to carry
the product for a nominal sum, so as to keep
the furnace in operation by giving its iron
access to more remote markets. It is not
now unusual to find Alabama or Michigan
charcoal pig iron offered for sale in Boston,
New York, Philadelphia or Baltimore, so
that a considerable proportion of the trade
which has kept some Western and Southern
charcoal furnaces in blast has been cap-
tured, by means of business energy and low
railroad freights, from other furnaces in the
East.

The general falling off in demand natu-
rally made the producers of pig iron who use
mineral fuel seek all possible avenues of
trade, and consequently they have invaded
what the charcoal ironworkers have been
pleased to consider as their special fields.
In some of the supposed special fields cer-
tain grades of iron made with mineral fuel
have undoubtedly given satisfactory results;
in others the attempts have been unsuc-
cessful.

The great steel works have found that
other manufactures besides rails were neces-
sary to maintain their plants in activity,
and many who assume that any steel is bet-
ter than any iron immediately announced
that "the steel age has come, and that iron
is a manufacture of the past." We realize
what an influence upon the industrial pro-
gress of the nation the steel works have had;
we appreciate the economy of the methods
employed, by which no halts or intervals are
permitted, but the processes are continuous,
and we understand the merit of homogeneity
in metal, and, therefore, do not underesti-
mate the advantages which steel possesses,
nor what has to be accomplished to suc-
cessfully compete with steel manufactures. But
we are aware that there is no well-defined
border land between iron and steel; neither
physical tests nor chemical analyses can de-
finitely determine what is iron or what is
steel. The investigations of Dudley, Sand-
berg and others prove that the nearer the
composition of first-quality wrought iron is
approached the better the steel is adapted
for railway service.

The safe commercial limits of tensile strain
for cast-steel boiler plate is but little beyond
the test demanded by the United States
Government for charcoal hammered iron.
The modern tendency is to limit the use of
steel for structural purposes to the milder
grades of the material. For steel in steam-
ships the United States Government specifies
as follows: Steel to have an ultimate ten-
sile strength of not less than 60,000 pounds
per square inch, and a ductility of not less
than 25 per cent. in 8 inches. Lloyd's
rules require the steel to have an ultimate
tenacity of not less than 60,000 or not over
70,000 pounds per square inch, with an
elongation of at least 16 per cent. in 8
inches. All of these circumstances seem to
indicate that charcoal iron, to have a future,
must depend upon quality of product and
economies of manufacture solely. By care-
ful selection of ores, judicious manufac-
ture of charcoal and careful management,
the output of charcoal blast furnaces
should be no more expensive than mineral-
fuel iron. This point secured, any superiority
of composition will bring an enhanced price.

The charcoal iron industry is in no worse
condition than most other branches of met-
allurgy, although the proportionate fall in
prices has been greater, because of the
special uses for the product. Whether the
output of our furnaces in the future is re-
quired for the manufacture of iron or steel,
superiority of product will command trade
and generally bring remunerative prices,
and it would appear that the true policy of
the manufacturers of charcoal iron at present
is to carefully study the details of each
individual plant. If saws can replace axes,
and 10 per cent. of the wood be saved; if
greater yields in bushels of charcoal per cord
of wood can be secured; if cleaner or richer
ores and remodeling of furnaces permit of
reducing the fuel consumption per ton of
iron, and if better administration and in-
creased output reduces the labor, superin-
tendence and interest per ton, a step in the
right direction will have been taken.

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METALLURGICAL NOTES.

Steel High in Manganese.

A patent has been granted to Mr. Robert Hadfield, of Sheffield, England that relates to further improvements in his newly-discovered treatment of steel with high percentages of manganese. His earlier patent had reference to the treatment of steel with percentages of manganese varying from 7 to 20 per cent. The present improvements relate to a further development of this principle of treatment and consist in adding the ordinary ferromanganese of commerce to iron either wholly or partially decarbonized and refined by any of the ordinary processes, or to steel in increased proportions sufficient to produce in the steel or decarbonized iron a percentage of manganese varying from 20 to 30 per cent., the amount being regulated according to the purposes for which the steel is required. He uses by preference a ferromanganese containing as high a percentage of manganese as possible, but low in carbon, silicon and other foreign bodies. To carry out this modified treatment he takes ferromanganese in suitable proportions, according to the percentage of manganese required in the steel. He then carefully melts it in a furnace, after which he pours it into the molten steel or iron. He next thoroughly blends it into one homogeneous mass by stirring or rabbling, after which the steel is run into ingot molds. The distinctive advantages claimed of employing such increased percentages of manganese exceeding 20 and up to 30 per cent. as against percentages varying from 7 to 20 per cent. are, first, that it is free from the fibrous condition in steel manufactured with such lower percentages; second, that considerably increased hardness combined with extreme toughness are obtained in the steel so manufactured. In addition to these advantages it possesses great fluidity and soundness from honey-comb and other defects, thus enabling castings to be made with great uniformity and regularity, and it requires neither tempering, rolling, forging nor hammering. The use of silicon to obtain soundness is also unnecessary. Such steel is particularly adapted for casting safes complete or for casting the linings of safes, railway wheels, armor face plates, rolls to replace those of chilled cast iron, and many other purposes where excessive hardness combined with extreme toughness is requisite.

A Basic Bessemer Blow.

During a recent excursion of the South Staffordshire Institute of Iron and Steel Works' Managers to Bilston, a blow in one of the three Bessemer basic converters of the Staffordshire Steel and Ingot Iron Company was witnessed. Into the converter some 6 tons of molten metal, obtained from one of the adjoining cupolas, had been poured. The pigs used in the cupola were of a white appearance, and contained 2½ per cent. of phosphorus, 3 per cent. of manganese, 1 per cent. of silicon, .05 of sulphur. About an hour had been occupied in melting them down in the cupola. Previous to the converter being charged it received some 18 cwt. of lime. The first blow in the converter occupied some 20 minutes, and when the flame showed that most of the impurities had been eliminated the after-blow was begun, and occupied about four or five minutes. Several succeeding samples were now taken out with a ladle, blowing being resumed between each sample until the required degree of purity was obtained. The blast was at length finally turned off, and 70 or 80 pounds of ferromanganese were added to the converter. A great part of the slag having been poured off, the contents of the converter were discharged into a ladle worked upon a hydraulic crane, the weight of steel being, it was estimated, about 5 tons. Through a brick valve at the bottom of the ladle six ingot molds were filled, and when they had been sealed down were left to cool. Afterward the visitors proceeded to the cogging and plate mills. Here oval ingots obtained from previous blowings were put straight through the rolls, having previously passed through the reheating furnace, since the company have not yet brought into use the double set of Gjer's soaking-pits which they have laid down in close proximity to the mills. One ingot, 18 inches wide by 10 inches thick by 3 feet 6 inches long, rolled into a plate which, after being sheared, was 26 feet long by 3 feet 4 inches wide by ¾ inch thick. Another plate was 33 feet long, 3 feet wide and ¾ inches thick. Mr. Gilchrist, the patentee of the process, explained to the visitors that the plates from each blow were tested before being sent out from the works, and that if they were found to be defective they were cut up. Mr. Gilchrist freely asserts that there is a great deal yet to be done to bring the process to a still greater state of perfection. He hopes that in a few years, with the assistance and knowledge of practical ironmakers, who are in increasing numbers taking a lively interest in this cheap steel-making, far more than now will have been accomplished. He has the confident anticipation of being able by-and-by to produce basic steel that shall answer every purpose now served by good quality Staffordshire iron.

Plant and Processes.

An annealing pot for use in wire mills, claimed to possess superior lasting qualities, has been invented by P. Wilkes, of Trenton, N. J. The pot is made of a mixture of iron and steel in the proportion about of one part of steel to nine parts of iron. It is cast into cylindrical form and has proper sand joints formed at the top and bottom. Teats or spurs project over its whole interior surface and extend in various directions. They form the means of securing a coating of sand or fire clay in positions to develop the pot and protect it from the direct action of the heat. The ordinary furnace or brickwork for confining the heat surrounds the pot.

W. H. Griffiths, of Worcester, Mass., has patented an apparatus for rolling metal bands by passing the billets continuously through a series of rollers, instead of passing them back and forth through different grooves. The train of rollers is composed of three or more pairs, one roller in each pair being grooved and the other tongued. In the first pair the tongued or male roller is on top, in the second it is at the bottom and in the third pair it is again on top. By thus

reversing the position of the male and female rollers in relation to the band which is rolled, the fins formed at the sides of the tongue of the male roller of one pair will enter the bottom of the groove of the female roller of the next pair, and will be removed or compressed into the body of the band. The rollers of the last pair are plain and are intended merely to finish the band. The rollers are mounted in any suitable framework, and are rotated at a proper speed in the usual manner.

A regenerative steel furnace of novel construction has been invented by W. G. Bell, of Alleghany City, Pa. The courses of brickwork composing the converging side walls are built on a flat key toward the fire-chamber, so that in case of shrinkage of the furnace the courses, not being arched, will settle down and prevent the formation of a space for the entrance of the flame and gases behind the wall. The heat from the fire-chamber shrinks the convergent side walls, and as there is no arch to support the convergent side walls, they sink down upon the piers, without leaving a space behind the walls or above the piers. Tubular port liners extend from the regenerator flues and fit within the furnace port or flue to prevent the gases from escaping through the piers or walls above the ports. The port liners are provided with one or more division walls which separate the air and gas until they reach the proper point to create the greatest heat within the fire-chamber.

A train for rolling metals has been patented by W. A. Sweet, of Syracuse, N. Y. The rollers are placed in pairs, and receive motion by belt and pulley connection from the driving shaft. The heated rod is passed through the first pair of rollers, and then fed through the usual trough to the second pair. These rollers are smaller in diameter than the first pair, but are speeded up so that their velocity is greater than the first to about the degree that the rod has been elongated in passing through the preceding rollers. The process is thus repeated through a train sufficient to reduce the rod to the size required, each pair of rollers decreasing in size successively with increasing circumferential velocity to take up the elongation of the rod. It is stated by the inventor that by this arrangement the temperature of the rod is kept up throughout the process to a greater degree than heretofore.

A new process of preparing old steel rails for reworking without employing any fluxes has been invented by W. Parkinson, of Hamburg, Pa. The old rails are cut into suitable lengths and a billet conforming in shape to the shape of the rail is bound to each side. A number of piles thus formed are placed in a heating furnace that is provided with a forced draft or blast and a chimney damper. The blast is turned on and the pile subjected to the heat until the surfaces commence to fuse and form a single mass of steel. The damper is then closed and the blast shut off. This will quickly reduce the heat of the pile, and a solid and compact pile will be formed. After this has been attained the heat is again increased until the pile is brought to a steel heat, when it is ready for reworking into a new article of rolled steel.

A puddling furnace in which either gas or solid fuel may be employed has been patented by E. J. Daschbach, of Pittsburgh, Pa. The furnace has the fire-chamber, bridge wall, grate and ash-pit all arranged as usual for the burning of solid fuel. When, however, gas is to be burnt, two or more gas burners are employed which act in combination with surrounding flues in supplying gas and air to the furnace. These flues are preferably placed below the grate-bar in the ash-pit, and are formed by two partition walls meeting at right angles in the forward part of the ash-pit. Into the flues are placed the gas burners, which are composed of two pipes or cylinders placed one inside of the other, so as to form a gas passage between them, while an air passage is formed through the inner cylinder. The gas passage is closed at the top and bottom, perforations in the former allowing the gas to escape in jets at the top. The jets are inclined, and thus a whirling movement is imparted to the gas as it passes from the burner.

J. Beasley, of Handsworth, England, forms the setting or lining for a furnace or converter of calcined tap-cinder from puddling furnaces and the slag from hammer slags. These materials, after they are ground to a condition similar to fine sand or powder and thoroughly mixed, are saturated with from 5 to 10 per cent. of hydrochloric acid diluted with about its equal weight of water. With these combined materials are then mixed about 20 per cent. of finely ground or slaked lime and about 5 per cent. of common salt. The mixture thus obtained is applied as a lining for the furnace, and may be dried before being used or applied in a moist condition. In treating low-grade pig iron the impurities, by combining with the hydrochloric acid, lime and salt, it is claimed, will be eliminated.

A damper or wind-valve patented by F. H. Cathcart, of Alexandria, Va., has for its object the regulation of the current of air supplied to a blast furnace. The damper consists of two flat and slightly hollowed pieces or shells of metal having around their edges a continuous groove or furrow. When the shells are placed in the supply-pipe of a blast furnace a space is formed in which the valve plate and rod are contained and move. The grooves are opposed to each other and serve to hold in place a soapstone or other packing which is used to render the valve tight. The shells are fastened together by means of small bolts.

A coke oven constructed by H. Stier, of Zwickau, Germany, is arranged so that the air or gas used for combustion is thoroughly heated and steam also generated. For this purpose channels or pipes are provided in the upper part of the apparatus for utilizing the radiating heat. Through these channels air and water are forced so as to become heated, when the water will turn into steam. The steam is serviceable for transformation into water-gas, which transformation can be accomplished by forcing the steam either alone or together with air into the coke chamber. This construction of oven may be used for treating bituminous and carbonaceous substances to obtain heating gases and products of distillation.

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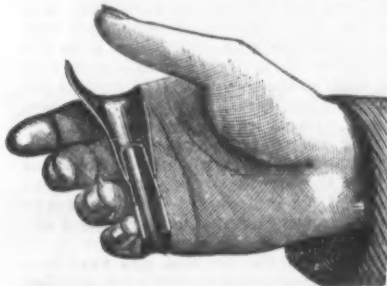
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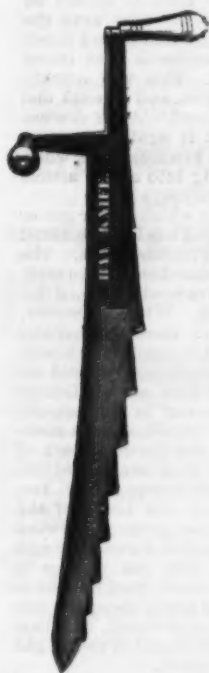
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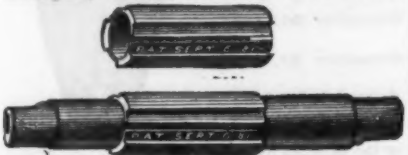
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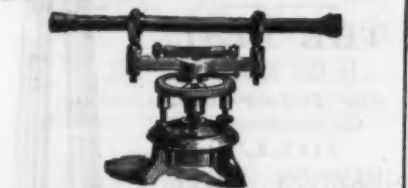
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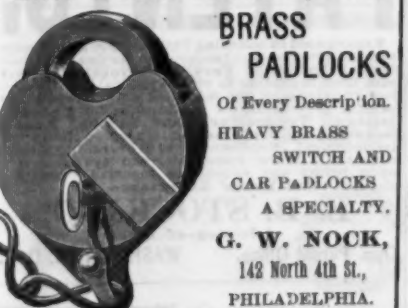
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W. A. Sweet, of Syracuse, N. Y., has constructed an apparatus intended in wire-rolling to insure the proper reeling automatically from the rolls at the highest velocity at which the wire can be delivered. As the wire is running off from the last pair of rolls it passes through a spout that guides it to the reel. This reel consists of a hollow rim of thin metal fastened to a face-plate which is keyed to a revolving shaft. The rim is made in two parts, one being conical and the other cylindrical. The rim receives and throws the end of the wire in a curve against the face plate, where it winds into a compact coil within the cylindrical part of the rim, which can then be readily detached to discharge the coil of wire.

An apparatus for preventing metal bars when rolled from running over the floor is made as follows: On each side of a train of rollers is placed a receiver consisting of a straight tube of metal having a flaring mouth which curves upward and opens opposite the rollers, so that the rod enters the mouth and runs down into the tube, which is buried beneath the floor. This device also prevents the rod from coming in contact with the workman, keeps it clean, retains the heat and holds it straight. The inventor, W. A. Sweet, of Syracuse, N. Y., prefers to place into the receiver a quantity of carbonaceous material. This ignites on the introduction of the rod and fills the tube with carbon vapor that envelops the rod. In operation the rod runs from the rollers into the mouth of the receiver until its rear end leaves it; it is then seized by the operator and returned in the usual way to the rollers, passing through in the opposite direction.

New Inventions.

J. Chase, of Rochester, N. Y., has patented a vertically adjustable chandelier which is provided with an automatically locking and releasing clamp. The chandelier is composed of two telescoping pipes, the inner and lower pipe carrying at its upper end a spring clamp that may be operated by a wire running down the pipe and connected to a knob at the bottom. The construction of the clamp is such that the more weight there is to the chandelier the tighter will it bite and bind the parts together. As the knob is pulled down the spring is contracted and the clamp released, when the lower pipe is free to slide down. The release of the knob will cause instantaneous relocking of the parts.

A wire fence patented by A. G. Hulbert, of St. Louis, Mo., has the body wires connected to one another and to the selva wires by a simple ring or coil tightly wound around the contact points. The coils are composed of flat metal strips or plates, and may be made with projecting ends to form barbs. In the manufacture of the fencing all the wires are drawn from stationary spools parallel to a reel on which the finished fabric is to be wound, and the binders are clinched on by a hand tool to form the junctions of the wires. The binders are tightly compressed in the act of clinching, and in this way the wires are sufficiently bent to prevent the sliding of the binders thereon.

A miners' safety-lamp for burning volatile hydrocarbon oils has been patented by C. Wolf, of Zwickau, and H. Friemann, of Eisenberg, Germany. Heretofore heavy non-volatile oils and fatty substances have been exclusively burned in miners' safety-lamps, because such oils and fats reduced the danger of explosion. But these substances cause a deposit of carbon particles upon the wire gauze when the wick is turned up too high, which, becoming heated, ignites the fire-damp on the outside. With volatile oils, on the other hand, the turning up of the wick causes a rapid and excessive formation of vapors which prevent the entrance of air to the burner and soon extinguish the lamp. The lamp is provided with a perforated tube around the wick tube, and the space between the perforated tube and the bowl of the lamp is filled with cotton or other absorbent whereby the accumulation of vapors is prevented. A percussion attachment enables the lighting of the lamp without opening the same or without compelling the miner to leave the mine for the purpose of relighting it.

E. Bouhey, of Paris, France, has patented a machine for chamfering sheet-metal plates. The machine is so constructed that it will chamfer or bevel the edges of the plates with accuracy without requiring the sheets to be first flattened and clamped on a bed or table. The cutting tool, having any desired bevel, is made to follow all the undulations of the sheet by means of a guide attached to the tool-holder and embracing the edge of the sheet operated upon. The sheet abuts against cleats fixed to the bed of the machine to resist the force of the tool. The machine is especially adapted to chamfer the edges of boiler and other plates, so that they are in proper condition to be soldered, brazed or welded.

The Jarvis Engineering Company, of Boston, Mass., are the assignees of the patent right in a new furnace. The walls of the furnace are provided with air-heating passages through which the air is admitted to the combustion chamber above the fuel. The heated air combines with the partially-consumed gases and smoke arising from the fuel, and produces perfect combustion. The heating passages are connected with an air-forcing apparatus, which is controlled by a valve or cock working in unison with the damper in the escape-flue. Thus the escape of the products of combustion is increased or decreased in proportion to the amount of air admitted. The furnace will therefore always work freely, and the fire will be under complete control.

A damper regulator patented by R. Thompson, of New York City, offers a gradually-increasing resistance to the rising piston that controls the damper. This is accomplished by supplying the cylinder at the top with a regulating air-cock just above the highest point the piston reaches. The cock has a discharge nozzle, so that any water that may accumulate above the piston is freely discharged. To the piston is affixed an arm or guide-bar, which, as the piston rises, gradually closes the air-cock. In this way the resistance offered to the piston by the air above it is gradually increased. The extent of the gradual closing

of the cock is governed by the inclination given to the guide-bar, but in no case should the cock be caused to entirely cut off the air. As the piston descends the cock is re-opened.

J. W. Bailey, of Denver, Col., has patented an ore pulverizer of the following construction: Through the center of the pan extends upwardly a muller carrying at its lower end a disk having radial slots. An annular sectional bar rests upon the disk and has depending lugs which occupy positions transversely to the slots and prevent vertical movement of the sections on the muller disk. A series of cylinders are arranged in a circle within the pan in proximity to a small annular band which is in contact with the sides of the pan. As the muller and disk are rotated the sections of the bar above are thrown out of the slots and brought in contact with the sides of the cylinders, imparting rotary motion to them. This arrangement results in securing for each cylinder four points of its periphery where the grinding action takes place—one against the bar, two against the adjoining cylinders and one against the band. Thus a high grinding capacity is secured for each cylinder, and, moreover, obstructions may pass between the grinding surfaces without interfering with the continuous operation of the machine.

A new ore separator is composed of three water compartments placed side by side, one higher than the other. Above each compartment is a perforated tray having at one end a riffle board which projects into the adjoining compartment. In front of each riffle board there is formed in the tray an opening covered with coarse screen and containing shot or sand. The stock is placed on the highest tray, and is fed forward by means of a series of shocks, imparted by suitable machinery, which will cause the stock to be spread on the tray and to travel toward the riffle board. As the stock reaches the opening in the tray, the first-grade ore overcomes the pressure of water, and works its way through the shot, so as to drop upon the bottom of the compartment. The remainder of the stock floats over the riffle board and drops upon the tray of the second compartment, where the second-grade ore will be separated in a similar way. What is now left passes upon the third tray, where the third-grade ore is separated, while the residue is floated off. J. W. Bailey, of Denver, Col., is the patentee of this separator.

J. D. Huntington, of Chicago, Ill., is the patentee of an ore crusher of the following construction: Upon a solid upright rests a truncated conical crushing head. A case surrounds the crushing head, and is supported on top by a ball upon which it rests, and which is in turn supported by the upper edge of the crushing head. At the bottom the case has suitable discharge openings. Motion is imparted to the case by bevel-gear connection in such a way that it revolves in an eccentric curve around the crushing head. The crushed particles of ore fall through the discharge openings and drop upon an incline which conducts them to a suitable receptacle.

An ore-jigger for cleaning and separating ores has been patented by B. F. Cruzan and J. J. Robinson, of Webb City, Mo. It contains a plunging sieve placed within one end of an oblong tank. Above the sieve are a series of parallel fixed partitions which are in contact with a series of adjustable partitions, so arranged that the partition walls may be made higher if desired. The discharge holes in the sieve-frame have semi-circular guards and sliding-valves. When the sieve is raised a flexible pole is slightly bent, and when the downward motion begins the sudden straightening of the pole will give a jerk to the sieve and loosen the mass therein, to be better acted upon by the plunger. The cleaned and separated ore sinks to the bed, passes under the guards and gradually rises within them, till discharged through chutes into a narrow compartment formed along one side of the tank.

M. B. Dodge, of San Francisco, Cal., has patented a revolving ore-roasting furnace. The body of this furnace is set on a horizontal plane, and is not made cylindrical, as is customary, but with six or eight sides. Each of the sides is slightly rounded, so as to hold the brick lining properly in place. At each end of the roasting cylinder there is a flange, provided respectively with the feed and discharge opening. The discharge opening is larger than the feed opening, in order that the ore, when being fed continuously, will be discharged automatically without employing conveyors or other internal obstructions to the free action of the ore. As the body of the furnace is rotated, the heat and flame pass through the discharge opening and out of the feed opening in an opposite direction to the travel of the ore. The furnace may be either charged continuously through a hopper or from time to time through a door.

An ore concentrator for washing, concentrating and separating ores has been patented by W. B. Kennedy and W. M. Nesbit, of Silver Reef, Utah Ter. Along the upper part of any suitable long box or sluiceway are arranged a series of agitators and governors, and along its lower portion another series of wings are arranged to form eddies and whirlpools which effect the concentration and deposit of the ore. Before each agitator an eddy is formed which effects a deposit. Between each agitator and governor a whirlpool is caused which effectually washes and concentrates the ores. Between the lower governor and the upper wing, and also between the wings, eddies are formed, where the finer concentrates are deposited. All these devices are so connected that they may be removed to enable the concentrates to be washed out of the sluiceway at the lower end into suitable receptacles, instead of shoveling them out in different piles along the sluiceway.

A wet-ore concentrator has been invented by W. B. Farwell, of San Francisco, Cal. Four flat metal spring bars support a vibrating frame carrying two rollers, around which the endless concentrating surface is wound. This frame is so set that the concentrating surface, while traveling longitudinally and while receiving vibrating or shaking motion, is practically horizontal. An endless traveling scraping device is operated above the concentrating belt, acting both as a distributor to take the pulp from the supply hopper and distribute it over the concentrating surface, and also as a carrier or scraper

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SECOND, I further undertake and agree to and with the said John Wilson, and his legal representatives, not to manufacture or sell, or cause to be manufactured or sold, at any time in the future, Knives or other Cutlery, bearing his trade-mark aforesaid, or any imitation or simulation thereof. IN WITNESS WHEREOF, I have hereunto set my hand and seal at West Mansfield, aforesaid, this thirty-first day of May, 1883.

WITNESSES—
E. M. REED,
(Attorney for Defendant.)

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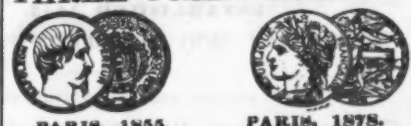
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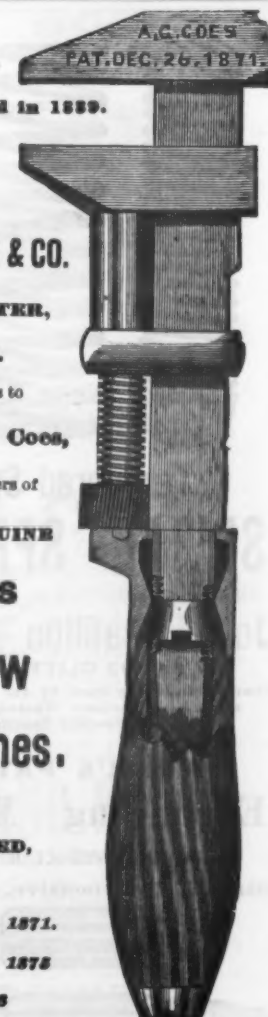
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to move the upper part or stratum of the pulp off from the concentrating surface at its tail end. The scraper is produced by bending up strips of sheet metal and fastening them to runner belts of leather, rubber or other suitable material. In this machine the movement and flow of the water and lighter matter are effected mainly by the action of the traveling scrapers, so that an even distribution of the pulp of uniform depth is maintained over the concentrating surface, and so that the worthless matter is constantly worked against the travel of the belt and discharged from the tail spout.

A new mode of making wrench forgings out of the commercial bars of iron or steel is as follows: Take commercial bars substantially rectangular in cross-section, with greater width than thickness, and cut them, cold or hot, into the lengths or bar sections. Then, by suitable cutting dies, cut these bar sections into two corresponding L-shaped blanks. Then heat the larger end of the blank to a forging heat and place it in a holding die which has a head matrix and a bar matrix. A heading die is then advanced, upsetting the enlarged end of the blank and forcing the metal to fill the head matrix, after which the heading die retreats to its normal position of rest. Practically, the amount of stock in the enlarged end of the blank should be slightly in excess of the amount required for the head of the forging, in order to insure the complete and entire filling of the head matrix. The excess will form a fin on the forging, which is afterward trimmed off. The Collins Company, of Collinsville, Conn., have patented the above method.

An apparatus for concentrating gold, silver, sulphurets, amalgam and other valuable substances has been patented by E. Koch, of San Francisco, Cal. It consists of a circular sectional table having chambers parallel with the outer sides of the sections and extending toward the center. Each chamber has a discharge opening in the center of its bottom. Above the chambers are corresponding frames with V-shaped bottoms slotted for the escape of the concentrations into the lower chambers. The bottoms are suspended in such a way that they may be raised and allowed to fall upon the bars dividing the sections below. Thus a jarring blow is produced which will assist to separate the heavier from the lighter particles.

Standard Time.

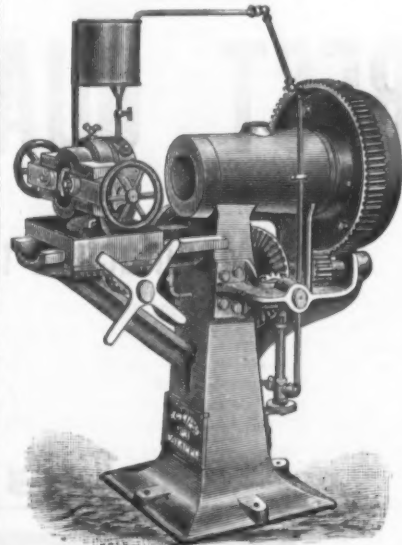
The question of standard time for this country seems to be definitely settled, notwithstanding the defection of a few cities and towns of minor importance. So many of our people travel, and so many of our interests are controlled directly and indirectly by the railroads, that the plan of time which the latter adopt is very sure sooner or later to be the plan adopted by the entire people. The question of standard time being once determined, the secondary question of dial reform comes up. Instead of our two divisions of 12 hours apiece, which now make up the day and night of 24 hours, the advisability of numbering the hours consecutively from 1 to 24 is being discussed. Already in many jewelers' windows may be seen watch-faces provided with a double ring of figures, the inner one of which shows the figures 13 to 24. Though to some extent this meets the primary objection to the change of hours, namely, that the 12-hour watch movements would be rendered useless, it does not altogether work simply and satisfactorily.

Another system has been invented by Dr. Whitney, a Philadelphia enthusiast. This needs a complete distribution of the figures on the dial, and in this particular only is bettered by the form above described, which can be adapted to any existing watch-face. According to the new method the figures from 1 to 24 are arranged as it were upon an endless band which crosses on itself, so that the figures 6 and 18 are in contact. Thus it will be seen that there is an outer rim with the figures 1, 2, 3, 4, 5, 18, 19, 20, 21, 22, 23, 24, and an inner rim with the figures 13, 14, 15, 16, 17, 6, 7, 8, 9, 10, 11, 12. The 13 of the inner rim is under the 1 of the outer rim, and the other numbers follow in the order given. Starting our 24 hours at midnight, one can use up half the outer rim until the morning hour of the workaday world is reached. At 6 o'clock one can shift to the inner rim and use this throughout the day until the approach of dusk warns us that we have changed again on the outer rim, which is accordingly used until midnight. It may be remarked that the day would have to begin at midnight instead of, in astronomical fashion, at midday. Were this not the case it would be one day of the month in the morning and the next day in the afternoon. This plan of arranging the dial has secured the warm commendation of Sanford Fleming, who was one of the chief movers in the introduction of the standard time system. There seems but little doubt that at the international convention shortly to be held the subject will receive full discussion, and it is hoped that the railroad companies will make the first move by adopting it on their time-tables, thus doing away with the necessity of the awkward and puzzling "a. m." and "p. m."

As we have already shown in these columns, one or two railroads have adopted the new plan for their time-tables above suggested. We have already commented upon the novelty of trains starting, for example, at 10.30, and reaching their destination at 10.15 o'clock. Gradually the improvement is being introduced in other directions. A certain club whose meetings are regularly held in this city sends out all its announcements based upon the 24-hour system. Various organizations of a business and commercial character have adopted the new dial, so far as concerns their official announcements. Among the latter may be mentioned the Institute of Accountants and Bookkeepers, of this city. At the time of the revision of its by-laws some time since, the hours of its meetings were fixed by the new system, and the official notices of its secretary are sent out from month to month naming hours by the new dial. The further improvement that is demanded in the matter of time divisions will, we think, at the proper time be quite as easy of accomplishment as the standard time system which the railroads put into force a few months since. The step contemplated has many advantages to recommend it, and all progressive people in whatever walk of life will undoubtedly favor its adoption.

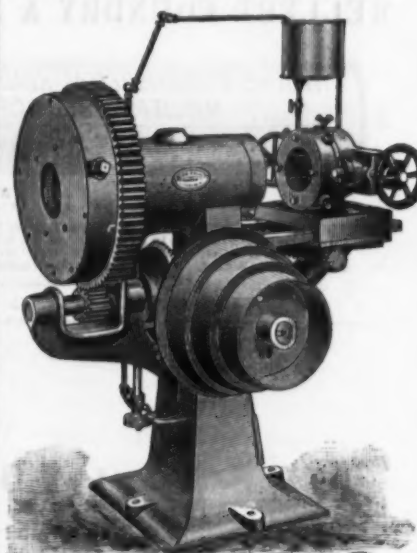
Eclipse Power Pipe Machinery.

The favor with which the "Eclipse" hand pipe machines, made by Pencost & Maule, 243 South Third street, Philadelphia, have been received has induced the makers to place on the market a light and very compact power machine possessing similar features. This machine is illustrated in the



Eclipse Power Pipe Machine, Front View.

accompanying engravings. It is especially designed for use in large manufacturing establishments, mills, railroad and machine shops, as well as in the regular steam-fitting trade. The machine is simple in construction, powerfully geared, and occupies less floor space than any other tool of similar capacity. It is fitted with an automatic oil pump which is supplied from a small reservoir in the hollow base, from which the oil is pumped to the can on the cutting head. By this means a continuous flow of oil is supplied to the work without waste. The same oil is used over and over again, and is



Eclipse Power Pipe Machine, Rear View.

supplied in such a way as to obviate the necessity of oiling by hand. Unlike many other tools of its class, the gripping chuck is placed at the back of the machine, thus securing the greatest possible distance between the point where the pipe is held and that at which the threading dies operate. This arrangement secures straight and perfect threads, even when the pipe has a slight bend or kink in it as is frequently the case. By this arrangement, too, the gripping chuck is easily accessible, and makes a most convenient and powerful vise for screwing or removing fittings from the various sizes of pipe within the range of the machine. The machine is said to be noiseless in its operation, and is so compactly arranged that all the working parts are in convenient reach of the operator. In the cutting-off head the knife is reversed, thereby allowing oil to flow over the cutting edge in place of being carried away on the cutting, as is sometimes the case. It is not necessary to reverse the motion of the machine to cut off pipe after threading it.

A Technical School for Louisiana.—A symptom of the interest now being taken in practical matters in the South comes to us from the State of Louisiana. A wealthy gentleman of New Orleans has lately left a munificent gift of \$1,000,000 to the public, for educational purposes, on terms which have been accepted, and mutual and amicable arrangements have been made between the State and the Louisiana University to put the fund to an immediate and practical use. This university, which has an endowment of perhaps \$150,000 or more, a law school, a medical school and a library, with a considerable attendance of students in proportion to its limited means, is to receive the benefit of this fund and to be called in the name of the donor, the Tulane University. The president is William Johnson, Prof. John M. Ordway, of the School of Technology at Boston, has been offered and has accepted the chair of industrial chemistry, a position nominally the same as that which he has so long and capably filled in the Massachusetts institution. It is a part of the plan, however, to develop a technical department in the university, and to this work Professor Ordway will give his experience and his administrative ability. This venture will be regarded with interest and approval in the North, making, as it does, a decided step in the right direction.

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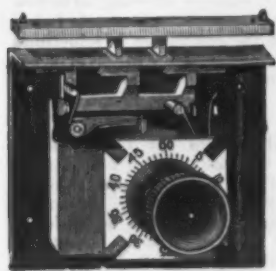
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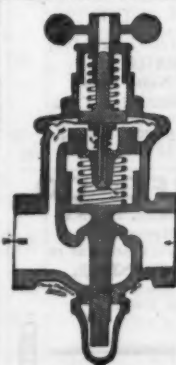
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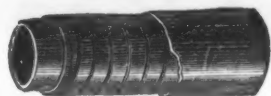
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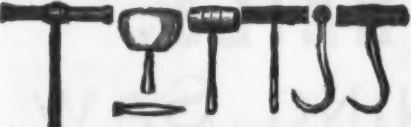
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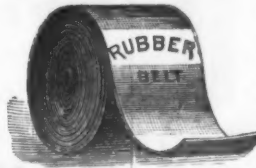
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BROOKLYN, N. Y.**DROP**HAMMERS,
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POWER PRESSES.**SCIENTIFIC AND TECHNICAL.****Heat Due to Electric Currents.**

An interesting paper on the heating effects of electric currents has been communicated to the Royal Society by Mr. W. H. Preece. With bare platinum wires of small diameter, the general law governing the ratio between the current strength and the diameter of the wire, when the latter is raised to a definite temperature, and where radiation is free, appears from Joule's law to be that the current should vary as the diameter $\times \sqrt{\text{diameter}}$ or $c = d \sqrt{d}$. Both the results of Mr. Preece's experiments tend to show that the current varies as the diameter. Platinum wires are, however, liable to flaws which practically reduce their effective diameter. Mr. Preece has also determined the strength of currents which produce self-luminosity in wires of different kinds and sizes. These currents were measured by finding the difference of potential at the ends of a thick German-silver wire, whose resistance was .0157 ohms inserted in the circuit. The results with copper, Swedish wrought-iron, German-silver and platinum wires showed that the law $c = d \sqrt{d}$ held very well for all these wires except with those of platinum, the point of low red heat being taken as the fiducial point. The temperature of a wire which becomes self-luminous has been given by Draper as 977° F., and by Daniell as 980° F. The exception in the case of platinum may account for its exception to the law in the former experiments. Mr. Preece infers from his experiments that electric-light wires should be made large enough to avoid the possibility of heating them above normal temperatures; otherwise, points of danger are easily reached by increments of currents.

A New Astronomical Telescope.

A modification of Loewig's great telescope has been devised by M. Hermite, and submitted to the French Academy of Sciences. The instrument as described in *Engineering* is mounted as an equatorial and comprises two parts, one movable, the other immovable. The immovable part is a telescope tube directed parallel to the axis of the earth. The movable part comprises the objective and divers accessories which allow the observation of all parts of the celestial vault by aid of two movements communicated to them at will by toothed wheels; one of these wheels receives the parallactic movement. The objective is placed, not perpendicularly to the axis of the tube, as in the ordinary telescope, but parallel to that axis and in a box of triangular section, with the tube of the telescope entering one of its walls with gentle friction. The wall perpendicular to the latter carries the objective, and the third wall, inclined at an angle of 45°, carries a plane mirror on which receives the rays coming from the objective and reflects them up the interior of the telescope tube to the ocular lens. The box is closed laterally to forbid the introduction of outside rays. It follows from this construction that by turning the box round the tube of the lunette or telescope tube the observer can see all points of the sky situated on the celestial equator. This movement of rotation corresponds, therefore, to that of an equatorial round the axis of right ascension. To obtain second movement of rotation corresponding to that of an equatorial round the axis of declination, a new box carrying a mirror inclined at 45° to the objective can be moved circularly round the latter. This box is open in front of the mirror; consequently the first or interior mirror and the objective can move in a plane perpendicular to the tube of the lunette, while the second or external mirror which receives all the rays before they are sent to the observer possesses two movements, one in a plane also perpendicular to the tube of the lunette, the other in a plane at right angles to this latter movement. As in M. Loewig's instrument the observer can be comfortably seated at his work, the tube of the lunette can be constructed in masonry if necessary, and as only the movable part, which is very small, requires protection, the expense of a dome is saved.

The Electric Light in the Mechnich Mines.

The electric-light installation at the Mechnich mines, in its once volcanic Eifel district in Rhenish Prussia, says *Engineering*, has now had a fair trial for more than three years and has proved a complete success. The expectation that it would both facilitate the operations and increase their security has fully been realized, and an extension of the plant is now being carried out. Messrs. Siemens and Halske, of Berlin, undertook the work. An open working 2000 feet long, 1000 feet wide and over 300 feet deep, in which 300 men and 20 horses are continually occupied, was first to be supplied with the electric light. This part of the mine is excavated in steps, the horizontal terraces being provided with rails. Ordinary lamps in globes on poles were out of the question, as blasting operations continue throughout the day, and the shots would soon have made havoc of the lamps. After several trials two powerful lamps of 3000 candles each were erected at the upper margin of the pit, where they were fairly out of the reach of the projected stones, and reflectors were fixed to throw the light down upon the steps. To find the proper positions for these powerful lamps and to avoid too dark shadows caused some difficulty. But the illumination was finally rendered most efficient, and the open pit, with the light playing on the whitish-gray rock, affords a fine spectacle. As any interruptions, even for short periods, such as those occupied in renewing the lamp carbons, would be dangerous, the whole plant is double, each lamp receiving its current from a D₂ dynamo. No hitch of any kind has occurred, and the safety of the miners has decidedly been augmented. It was formerly not always possible for the superintendents to see whether the loose mass resulting from the blasting operations had been properly removed, and frequent minor accidents arose from the debris falling down upon the miners engaged on the step next below. The work can now be controlled much better than before, when petroleum lamps and hand lamps were in use. The cost shows a saving of about 4d. per hour in favor of the electric illumination.

The satisfactory results obtained in the open working induced the company to introduce the electric light down in the subterranean galleries. The ore forms little concretions of sand and galena scattered all through the rock; the whole mass has therefore to be brought to day to be disintegrated and sifted, and the mining proceeds in parallel and cross galleries, which are constantly being widened until they become 90 feet in width and 70 feet in height, by sometimes 300 feet in length. The operations in themselves would not require much light if there was not always danger threatening from loosened pieces of rock. Pitch torches were formerly employed to examine the bore holes and fissures round them after each explosion. It was a question whether the arc lamp would answer for this purpose in the smoky atmosphere. For the first experiments, arc lamps of 3000 and 1000 candles were used, with the positive carbon in the lower holder. The effect was brilliant, yet the light did not penetrate the white smoke cloud which collects at the upper wall immediately after the shot. But as the smoke settles within 10 minutes, it was thought advisable to acquiesce in this interruption of a few minutes, and to use smaller lamps of 350 candles, which proved quite efficient. Of these there are 10 in use, with about 10,000 feet of lead cable, the cable being partially elastic, as the lamps, with their wires, have to be removed when the blasting is to take place. The lamps were originally supplied with hexagonal lanterns with obscured glass to protect the eyes of the miners. The glasses were, of course, soon broken, but no complaints are said to have been made about the naked electric lights.

The Dilatation of Liquids.

In a former paper to the Russian Chemical Society, Professor Mendeléeff had arrived at the conclusion, says *Nature*, that the dilatation of liquids can be expressed by the formula $V = \frac{1}{1 - kt}$, where k is a module

which varies for different liquids, and increases with their volatility. The researches of M. Van der Vaals, combined with the above, have enabled Messrs. Thorpe and Rüchler, in the April number of the *Journal of the London Chemical Society*, to establish the remarkable relation between the absolute temperature of boiling, t_b , reckoned from the absolute zero (-273°), the volume V_b , measured at a temperature t , and a constant a , which seems to be near to 1.995 or 2. Now, in a communication to the Russian Chemical Society, vol. xiv., fasc. 5, Professor Mendeléeff shows that, if the dilatation of gases and that of liquids be expressed by the formulae

$$V_t = 1 + at \text{ and } V_t = \frac{1}{1 - kt}, \text{ which would give } 2t = \frac{1}{k} - \frac{1}{a}, \text{ and the constant } a \text{ be}$$

taken equal to 2, we receive $\frac{1}{k} = 2t_b + 273$, where k and t_b are determining one another. This deduction is confirmed, in fact, by direct measurements. The further progress in the mechanics of liquids, he says, must be expected from new experimental and theoretical researches into the compressibility of liquids at different temperatures and into its relations to the modulus of dilatation; the fundamental equation of liquids must express the relations between their volume, temperature and pressure, as is the case for gases. As to a complete conception of the ideal state of bodies, it must contain also the relations to their molecular weight and composition.

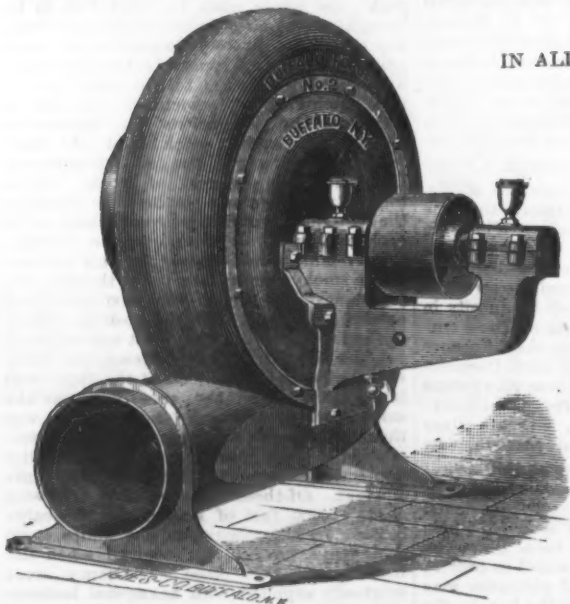
Ship Signaling at Sea.

Among the papers read before the Association for the Advancement of Science, by Prof. A. G. Bell, was one on a new method of signaling between vessels at sea. It is done by means of the telephone, but the inventor could not yet foretell what practical results it might lead to. Signals had been successfully exchanged between two boats in deep water a mile and a quarter apart. In one boat was a telephone, with one of its two terminals hanging over the bow, and the other trailing in the water over the stern. The arrangement was the same in the other boat, except that, instead of a telephone, it contained an electric battery, with an apparatus for interrupting the current very rapidly, as often as 100 times in a second. Every time the battery was connected with the water the latter became charged, and when the circuit was interrupted ceased to be so, and a musical note was produced in the telephone of the distant boat. These results were obtained with a very imperfect apparatus. The musical note could be produced at will at different intervals, and an alphabet was arranged by means of which messages could be transmitted. A skillful operator could read a message communicated in this way with the greatest ease. In connection with this invention Professor Bell said that if Professor Trowbridge, of Harvard College, had not had the idea of a galvanometer, instead of a telephone, and of charging the water with a dynamo-electric machine in a similar way, the idea of applying the telephone for that purpose might not have occurred to him. The professor thought that by this means vessels might discover their proximity to each other during a fog. Nearly all steam vessels have dynamo-electric machines to produce the electric light. This machine could be used to charge the water when the steamer runs into a fog, such as is always found off the coast of Newfoundland, and would give an electric signal to any vessel dangerously near to it.

The Marnaut Safety Lamp.

An exchange quoting from a French report gives the following description of the Marnaut safety lamp: In its present improved form the Marnaut safety lamp has a strong glass cylinder 2.44 inches high, 1.65 inches diameter and .31 inch thick, secured in a protecting cage on the top of the oil reservoir, as in the Mueseler lamp; but the Mueseler chimney and the gauze diaphragm that carries it are done away with. Surrounding the glass cylinder and flush with its inside circumference is an inner gauze cylinder 6 inches high, tapering slightly smaller upward, and closed at top by a gauze diaphragm. An outer gauze cylinder, about 1/4 inch larger in diameter, 3/4 inch taller and similarly closed at top, incases the inner gauze, and is fixed at bottom into the copper

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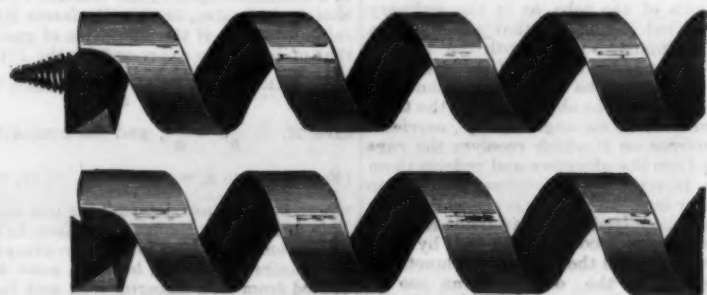
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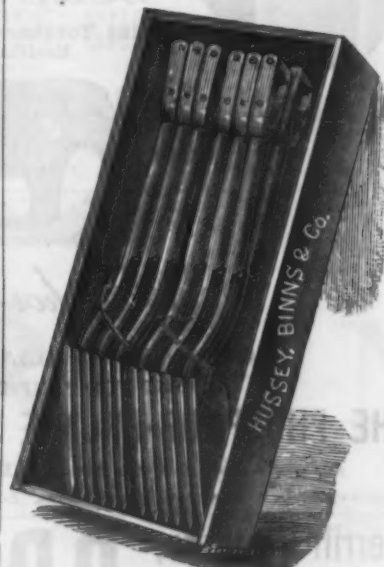
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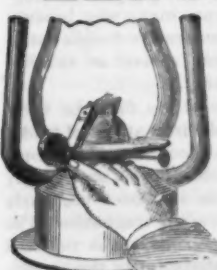
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ring that forms the upper ring of the cage holding the glass. The mesh of the gauze is 930 holes per square inch, or $30\frac{1}{2}$ per lineal inch. The entire gauze is shielded by an external sheet-iron casing, which can be lifted off at pleasure, having inlet holes round the bottom for the air to enter the lamp and outlet apertures at top. While the general shape and construction of the Mueseler lamps as sanctioned by practice are thus preserved in the Marsaut, the small horizontal annular diaphragm of gauze supporting the chimney in the former is replaced in the latter by the inner gauze cylinder, which presents a far larger cooling surface for the hot gases inside the lamp to pass out through. Additional safety can be secured by further covering the flat top of the inner gauze cylinder with a gauze hood, so as to double the thickness of gauze at that part, upon which the force of an explosion inside the lamp comes most direct. A third complete cylinder of gauze can even be added, if desired, as an extra precaution, but two are considered safe enough and preferable generally.

In the trials made of the Marsaut lamp, at Besseges, an explosive mixture was employed of air and of lighting gas, which latter fires more readily than fire-damp; and the wick being reduced below its usual flame, the conditions were thus more trying than are met with underground. With three forms of the Marsaut lamp, testing two lamps of each form, upward of 6000 trials failed to produce a single explosion; whereas 15 Belgian Mueseler, tested simultaneously, each of them about 100 times over, let the flame pass through the horizontal gauze diaphragm in 31 per cent. of the trials, and in $2\frac{1}{2}$ per cent. produced explosion outside of the lamp. Still severer trials were also made by mixing the air with lighting gas in their most highly explosive proportions—namely, 100 volumes of air to 20 volumes of gas—and exploding the still mixture inside the lamps by an electric spark. Under this excessive test the large Davy lamp used in the Gard district exploded the mixture outside it every time; the Boty Clanny and Belgian Mueseler, and the Marsaut lamp with two gauze cylinders, almost every time; but 12 trials of the Marsaut with three gauzes, and 10 of the fire-trier's Davy, gave not a single explosion outside. Investigating experimentally the mesh and shape of the wire-gauze cylinder, the conclusion was reached that for the total area of apertures per square inch gauze of finer mesh is safe than a coarser and heavier make. The lamp should be made inside as nearly cylindrical as possible throughout its entire height, and in particular the bottom of the gauze should be flush with the inner circumference of the glass. Any narrowing at this part, by the insertion of a horizontal annular diaphragm projecting inward, or by contracting the gauze cylinder to a smaller diameter than the glass, is objectionable, doubtless because the explosive mixture inside the lamp gets thereby so churned up as to augment enormously the rapidity with which it explodes, enabling the flame, consequently, to pass out through the gauze. The lighting power seems to depend partially upon the metal of which the lamps are made, a brass lamp being found to give only 70 per cent. of the light obtained from the same make in wrought iron. The difference is no doubt connected with heat-conducting capacity. English lamps are generally made of brass, and German of wrought iron. M. Marsaut is inclined to think steel, or perhaps malleable iron, would be advantageous.

Marsh Gas as a Refrigerator.

The pneumatic machine employed by M. Wroblewski in liquefying and evaporating ethylene and oxygen to produce intense colds, says *Engineering*, has also been recently used by him to evaporate liquid marsh gas. He has thus obtained a temperature of -155° and -160° C., which is the temperature of ebullition of the liquid gas. It is a useful temperature as coming between the temperatures of -144° C. and -184° C., which are obtained with ethylene and oxygen, but it varies with the degree of purity of the gas. Oxygen, atmospheric air, nitrogen and carbonic oxide cooled with the marsh gas can be liquefied under feeble pressures, so that a chemist who succeeds in producing pure marsh gas easily and economically will render a service to science.

Heat Absorbed by the Atmosphere.

Professor Langley, of the Alleghany Observatory, has for some time past been making a series of experiments to determine what proportion of the heat from the sun is absorbed by the atmosphere. To assist him in his researches, Professor Langley has found it necessary to construct a special instrument to take the place of Melloni's thermopile in measuring slight differences of temperature. For this purpose he uses what is called a spectro-bolometer. The new apparatus consists of a large spectroscopic, which, instead of throwing the spectrum on the objective of a telescope to be viewed by the eye, throws it on the face of the bolometer, which measures the heat of the different portions of the spectrum. The bolometer depends for its action upon two equal electrical currents, the conducting wires being so placed that the needle of a galvanometer remains stationary during the passage of the current. If, however, the wire which conducts one of the currents be heated, its electrical resistance is increased, when the needle of the galvanometer will evidence the change. The part of the circuit exposed to the influence of heat consists of a fine strip of platinum foil fixed in an ebonite case. It is said that this instrument is sensitive to a change of temperature of $\frac{1}{1000}^{\circ}$. The results of months of work by Professor Langley and his assistants have led to the conclusion that the amount of absorption of the sun's rays by the atmosphere is much nearer 60 than 20 per cent., the number formerly given.

The Norfolk and Western Railroad Company own about 1000 acres of land at Lambert's Point, just 4 miles below Norfolk, Va., and they are now building there one of the finest coal-shipping piers in the United States, sufficiently long for seven or eight vessels to load at once. The coal comes from the Pocahontas mines, and the company expect to be able to compete in the sea-

board markets with Cumberland or Clearfield. Several new short branch lines are now being constructed to points within about a mile of Pocahontas, where new mining operations have been started, and it is calculated that by the middle of October shipments of from 3000 to 4000 tons per week can be made.

Blast-Furnace Capacity and Production.

In the August number of the *Journal of the American Charcoal Workers' Association* of the United States is a paper, by Mr. Birkinbine, on the estimated capacity and actual production of blast furnaces in this country. Mr. Birkinbine begins his discussion of the subject by remarking that "the difference between the capacities and the output of our blast furnaces is often misunderstood by those who discuss iron statistics, and the relation between the total number of furnaces and the number in blast seems to be but imperfectly appreciated," and then proceeds to give a series of tables, covering the years 1872 to 1883, compiled from the annual statistics of the American Iron and Steel Association and from the quarterly statements of *The Iron Age*. His analysis of the figures and conclusions are given as follows:

We find that the January reports generally show a maximum number of all blast furnaces active; that April ordinarily exhibits the largest number of bituminous furnaces in blast; that the greatest activity in anthracite furnaces has been noted by the January reports; that the maximum number of charcoal furnaces are in operation chiefly when the October and January returns are made, and that the minimum number is generally in April. The latter fact is owing to the practice which many charcoal furnaces will pursue of blowing out early in each year when the stock of charcoal is exhausted. As in most parts of the country where the charcoal pig iron is produced charcoal cannot be made in meilers before May, a large proportion of the furnaces are idle when the April returns are collected. At no time since 1873 have over 63.7 per cent. of all the furnaces in the country been reported as in blast, and the proportion of active furnaces has been as low as 30 per cent. of the whole. The largest percentage of active anthracite furnaces returned was 82.1, as shown by the record of furnaces in April, 1880, and the least proportion of anthracite furnaces in blast was 31.1 per cent., in September, 1876. The bituminous furnaces show less variation than those using anthracite fuel, the maximum percentage of the bituminous furnaces being 7.7 in April, 1881, and the minimum 36.3, in September, 1876. The returns for December 31, 1873, show 68.1 per cent. of the charcoal furnaces in operation, and those for April, 1877, but 20.2 per cent. in blast.

We think that this analysis may surprise some of our readers, for few will surmise that in the past 11 years there has at no time been two-thirds of all the blast furnaces in the country in operation; that the average proportion of active furnaces has been greater in those using anthracite than in those employing bituminous fuel or charcoal, and that, except in the years 1873 and 1874, and from October, 1880, to October, 1882, less than one-half of the charcoal furnaces have been reported in operation at one time. To estimate the aggregate furnace capacity of the country it would not be proper to divide the output of our blast furnaces in any one year by the average percentage of active furnaces in that year, because many reported out of blast are handicapped by situation, size, equipment or supplies, and go out of blast at times when more fortunate plants can operate successfully. There are, however, always a considerable number of blast furnaces being repaired or rebuilt; scaffolds, fires, chills, explosions, bad management, scarcity of fuel or ores, financial troubles and other causes are constantly occurring to withdraw furnaces from the active list, so that it is doubtful if under especially favorable circumstances the country could produce 75 per cent. of the total blast-furnace capacity in any year. The percentages above given show that the average activity is scarcely 50 per cent. of the total number of blast furnaces.

Messrs. Deans & Moore, of Penston Collieries, Haddingtonshire, says an English exchange, have lately adopted a new contrivance for economizing time and labor in connection with dispatches relating to their collieries business, and passing between their collieries and their offices at Smeaton Park. There is no telegraph office nearer to Penston than that at Tranent, which is about 3 miles distant, and telegrams are never delivered in less than hour from the time at which they are sent out from the Tranent post office. Messages, however, are now regularly received at each place from the other (a distance of $6\frac{1}{2}$ miles as the crow flies) in from $4\frac{1}{2}$ to 7 minutes. This result is accomplished by the employment of "homing" pigeons, which are kept at each place, and removed to the other as required. At first a watch had to be kept for the arrival of the birds, but one of the partners of the firm has perfected a plan by which they themselves register their arrival. Formerly they did so by ringing an electrical bell, which was found to be of service only when the office was occupied; now, by a glance at the window of a small box containing an electromagnet the clerk in charge can tell at once whether or not any of the winged messengers have arrived during his absence.

Two of the largest boring machines ever made for ordnance purposes have just been completed for the English Government by Messrs. Craven Bros., of Manchester. The machines, although they are not yet at work, have been put down at the Woolwich Arsenal. Each of these machines weighs 165 tons, and is capable of boring 30 inches diameter to a depth of 50 feet. They are similar in construction to smaller machines of the same type previously made by Messrs. Craven for the Government, but a special feature is the extra length of bore required for the guns that are now being built.

The Iron Age

AND

Metallurgical Review.

New York, Thursday, September 25, 1884.

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Our Purchases of Foreign Pig Iron.

We have recently had occasion to examine the statistics of the importations of pig iron for the past 30 years, and have been very greatly interested in noting the changes that have taken place from time to time during that period. The year 1855 was sufficiently in advance of 1857 to show a normal condition of trade at that time, uninfluenced by the financial disturbances preceding and following the panic of the latter year. From 1855, therefore, our statistics of importations may properly begin. In the table given below, the yearly importations of all kinds of pig iron from 1855 to 1884 are shown, including Bessemer pig iron and spiegelisen. The figures down to 1871 are for Government fiscal years, which extend from July 1 to June 30, but from 1871 to 1884 calendar years are given. This, however, does not interfere with our use of the figures for our present purpose. The table of yearly importations is as follows:

Years.	Gross tons.	Years.	Gross tons.
1855.....	98,925	1870.....	153,283
1856.....	59,012	1871.....	219,223
1857.....	51,794	1872.....	394,257
1858.....	41,996	1873.....	138,182
1859.....	72,517	1874.....	54,611
1860.....	71,498	1875.....	74,989
1861.....	74,026	1876.....	74,171
1862.....	32,247	1877.....	60,706
1863.....	31,007	1878.....	65,504
1864.....	108,223	1879.....	304,171
1865.....	20,052	1880.....	700,964
1866.....	102,302	1881.....	465,081
1867.....	112,042	1882.....	540,159
1868.....	112,191	1883.....	322,648
1869.....	136,975	1884 (est.).....	150,000

The influence of the panic of 1857 on importations of pig iron is here very clearly shown, only 41,986 tons being imported in 1858, against 98,925 tons in 1855. In three years following 1858 the trade in foreign pig iron, which at that time was mainly Scotch, picked up somewhat, but the civil war, beginning in 1861, seriously interfered with it, as with all other lines of business, domestic and international, and in 1862 importations dwindled to the lowest point touched in these 30 years—22,247 tons. The

trade recovered slightly in 1863, but in 1864, when most vigorous efforts were being made to supply all kinds of war material needed, importations jumped to 102,223 tons. A reaction occurred in 1865, and only half as much pig iron was purchased abroad. Between 1866 and 1869 general trade improved, the Bessemer process was introduced, Bessemer pig iron and spiegelisen were purchased abroad in considerable quantities, and importations advanced from year to year. At that time it was difficult to procure American pig iron suitable for conversion into Bessemer steel. From 1870 to 1873 a fever of railroad building raged, and foreign pig-iron makers were called upon for larger quantities of their products than ever before, the importations swelling until in 1872 they amounted to the unprecedented figure of 264,257 tons.

The panic of 1873, however, prostrated all business, and those engaged in the foreign pig-iron trade were not without feeling its effects. In 1874 importations fell to 54,611 tons, when the lowest point was touched since 1865. American pig iron at that time and in the four succeeding years was sufficiently cheap to induce many to use it who had for years relied upon favorite brands of Scotch and other foreign pig iron. Domestic makers had also overcome the difficulties in the manufacture of Bessemer pig iron, and Bessemer steel manufacturers had ceased to depend upon foreign pig iron for the raw material of their process. In 1878 it was generally supposed that the foreign pig-iron trade had forever lost its hold on the American market.

But in 1879 came the memorable and regrettable "boom." The demand for all kinds of iron and steel was so heavy that domestic manufacturers were unable to meet it, and in that year alone 304,171 tons of pig iron were received here from abroad, although only 65,504 tons had been imported in the preceding year. This was an unprecedented quantity, but in 1880 importations jumped to 700,964 tons, which was almost as much in one year as had been received in the four years covering the flush times of 1870-73, and more than the total importations in the 11 years from 1855 to 1865. This huge importation of foreign pig iron was not wholly the result of a scarcity of domestic pig iron, but was largely speculative, the price of the domestic article having been advanced to such a high as to encourage the influx of its foreign competitor. The receipt in this country of such a large quantity of pig iron was followed by arrivals aggregating 1,000,000 tons in the next two years, and 225,000 tons in 1883. The effects of this "boom" were felt some time after its collapse, pig iron having been imported for Bessemer steel-rail manufacture in considerable quantity even during the early part of the present year. Now, however, the only foreign pig iron coming here consists of Scotch pig iron imported for special foundry work, special grades of Bessemer pig iron for steel-making, and spiegelisen also for steel-making. The total importations of this year, it is estimated, will not vary much from 150,000 tons.

The effect upon the importations of pig iron caused by the various influences referred to above is perhaps more clearly shown by ascertaining the average yearly importation during the periods over which these influences extended. In the following table an attempt is made to present these statistics in the way referred to:

Periods.	Gross tons.	Periods.	Gross tons.
1855-60.....	65,955	1870-73.....	168,735
1861-65.....	56,081	1874-78.....	65,969
1866-69.....	115,885	1879-83.....	466,074

A vigorous effort is being made to capture the little remaining trade in the hands of the dealers in foreign pig iron. Ordinary Bessemer pig iron cannot be imported at present prices in competition with domestic Bessemer. Bessemer pig iron of special quality for use in open-hearth steel furnaces still comes into this country in limited quantities, but domestic pig-iron makers are turning their attention in that direction, and their efforts are meeting with flattering results. In the matter of spiegelisen and ferromanganese this country depends upon foreign countries less to-day than ever, with the prospect of being able to entirely supply its own wants at no distant day. The importers of Scotch pig iron are in better condition than those representing other branches of the foreign pig-iron trade, inasmuch as they have a demand that continues in spite of all efforts of American makers, though it has shrunk woefully from its proportions of a year or two ago.

We have made no allusion to the effects of the tariff of 1861 upon the pig-iron trade, as the subject is worthy of special treatment. The figures above given, however, show that the effects of that and succeeding tariffs have been very far from being prohibitory.

Last week some enterprising newsgatherer at New Haven, Conn., learned the startling fact that the clock factories in that vicinity, at which are manufactured most of the clocks exported, were threatened with serious competition from Germany. It was said that a German clockmaker, by sending his three sons into a New Haven factory, in its various departments, a few years ago, had captured all the secrets of Yankee cheap manufacture, and that he is now competing with them. Another very serious element appeared to complicate the situation, which was the tariff on imported steel necessary for springs. As our tariff is higher than that of Germany, the German clockmakers pay less for

English steel than our people do. A day or two after, the *New York Times* punctured this sensational story of an American industry tottering to its fall between foreign competition on the one hand and the duty on "raw material" on the other. An interview with a clock manufacturer had disclosed the fact that for many years cheap clocks have been made in Germany, but that our manufacturers have never found their trade appreciably affected by them. Further, "three sons of a German clockmaker" could not get all the secrets of manufacture, as there are about 30 separate departments in the factories, the work being so systematically divided that a workman does only one thing. And, finally, all the steel used in a clock, outside of a few pinions, is in the mainspring, which costs only from 4 to 17 cents. The average cost of the steel entering into an ordinary clock falls below 10 cents. The duty, therefore, would be very trifling and not worthy of consideration.

Speculation on 'Change.

The disastrous results of speculation in the stocks of corporate institutions and in our chief staple commodities are evident at a glance, even if we look no further back than last May's panic, which has, for the best of reasons, frightened away from our commercial exchanges in New York a large proportion of their former habitués. Complaint is constantly heard that the public (meaning "lamb" with wool ready for shearing) are no longer open to temptation, and that the value of memberships is constantly diminishing. Seats in the Stock Exchange, which formerly sold as high as \$32,000, can now be bought for about \$24,000, and the obstreperous brokers who once wallowed in wealth are now said to obtain only a precarious subsistence. The exchanges themselves, which for a time seemed to form a bonanza for the operators, now languish, and in some cases are on the verge of dissolution. The fact is that there is ordinarily little inducement to speculate on a falling market, and values continue to shrink, affecting almost every description of property. According to one estimate the losses sustained by individuals and firms who went down in the May panic figured up not less than \$50,000,000, which has been largely increased by recent disasters, not to speak of millions which have vanished from the assets of distressed millionaires. Almost universally the story is, "speculation did it."

The record of dishonor and suicide and flight is sufficiently extended and ghastly to suffice as a lesson for at least the present generation. Roulette and faro are illegal and disreputable, but a gentleman or a man of business may take "a flyer" on 'Change without discredit. It is time to look at such transactions in their proper light. A man without business obligations who has money of his own may risk and lose it if he wants to without being accountable to anybody, but the bank officer, the merchant seeking credit, or the custodian of trust funds, who risks everything on a fluctuation in a market where he has no business as an operator, should forfeit the confidence of business men, whether he makes or loses, quite as much as if his earnings were employed at the gambling table. There is such a thing as legitimate speculation, but it is restricted to reasonable and prudent risks within the limit of one's own business.

Without challenging dispute by affirming that the existence of exchanges is an unmitigated evil, we will concede that the commercial benefits are in some respects unquestionable. The widespread influence which they exert may be judged of from the following list of exchanges in New York City alone, together with the quotations of exchange memberships.

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Importers' and Grocers'.....	225.00	300.00
Manhattan Hay and Produce.....	35.00	45.00
Mercantile.....	325.00	325.00
Mechanics' and Traders'.....	40.00	50.00
New York Stock.....	22,000.00	25,000.00
New York Cotton.....	3,150.00	3,250.00
New York Coffee.....	500.00	900.00
New York Metal.....	140.00	150.00
New York Petroleum.....	325.00	350.00
New York Real Estate and Traders' dues not paid.....	1.00	2.00
New York Naval Stores and Tobacco, dues paid.....	60.00	75.00
New York Maritime.....	90.00	125.00
New York Mining and National Petroleum.....	500.00	525.00
New York Produce.....	900.00	2,850.00
New York Board of Brokers.....	400.00	75.00
Wine and Spirit Exchange.....	35.00	65.00

In the case of the Stock Exchange, transactions are on such a scale as to require banking institutions almost exclusively devoted to their interests, but at the same time so intimately connected with various trades and organizations as to endanger the entire banking system in times of financial excitement. It is, therefore, satisfactory to know that the talk about the formation of a bank and clearing-house for the special use of the members of the Stock Exchange is revived. Those features which most especially concern the public at large are certain disreputable practices fostered by their peculiar methods, some of them infamous. There was reason at the outset to fear the degenerating tendencies of the exchange, but of late, since the fright occasioned by the many revelations of dishonesty above referred to, and the ruinous depreciation of shares experienced within a few months, legitimate business is becoming less and less. In the absence of the public, gambling in "futures" and speculating in "margins" has received almost undivided attention. Under such influences it would not be strange

if integrity becomes an unknown quantity. Still more iniquitous is a practice lately in vogue of disseminating falsehood and deliberately assailing public credit in expectation of deriving profit from the general ruin invited. Unless restrained it would seem that no position of trust is beyond the reach of such miscreants; none are so secure upon the serene heights of virtue as to escape the general peril of attack by often invisible foes.

It is time that the leading representatives of trades which are now under the domination of exchanges should come to the front and take their management. If those which are in existence cannot be reformed, the solid men in their membership would do well to withdraw and found institutions which shall start and remain under good influences. Membership has been much too easily acquired. Seats should not be transferable without the consent of all concerned any more than memberships of clubs. Before a man can become a member of an exchange he should be required to show that he is legitimately engaged in the business to which it relates, is responsible and has a recognized position in the business world. We do not suppose that these suggestions are practicable at present, but at the rate at which things are running it will become a necessity that the exchanges shall be abandoned to the gamblers altogether or reorganized with the solid men in control.

Condition of the Foreign Iron and Steel Trades.

A glance at the iron and steel trades abroad shows them to be, with hardly an exception, suffering an equal, if not greater, depression than our own. Classifying the different European countries according to the dullness existing in their iron and steel industries, it would appear that England and Scotland lead, while the indications are that Austria is the least affected by the present general depression. Why it is that England suffers more than her Continental neighbors is perhaps difficult to determine, though it might be partially explained on the ground that her iron and steel works, whose products formerly went far toward supplying the needs of the world, have attained a development far greater than is necessary for the supply of her home consumption, and consequently depend to a large extent upon the demands of foreign markets. Apart from the present depression, however, these other countries to which she sent her iron and steel are year by year becoming more independent of English products, in some instances to the extent of successful competition in neutral markets. With a productive capacity so disproportionate to her own needs, it is not to be wondered at that England finds it difficult at present to dispose of her surplus products.

It would be a sufficient comment upon the condition of the trade in the different iron and steel centers of England and Scotland to say that in each and every one extreme dullness prevails, for, although the various local markets are from time to time subject, from many causes, to alternate flutterings of temporary activity and subsequently greater depression, their normal state remains the same, and thus far every hope of a brighter future has proved but transitory. In Wales, however, notwithstanding excessive dullness in the iron and steel trades, the industrial situation is comparatively good, owing to a fair amount of activity in coal, which gives employment at least to a large amount of labor, while the outlook is somewhat better for iron. Wales is also largely benefited by her extensive tin-plate trade, in which a fair amount of business is being done. Undoubtedly, the most important branch of the iron industry is the manufacture of pig iron, for the product being of no utility in its crude state, it is dependent upon further reduction for its consumption, and when the demand for it is and continues slack it bodes a serious condition in many other industries. Out of the total number of blast furnaces in England and Scotland hardly 50 per cent. are in blast, and the proportion of unworked furnaces is constantly increasing. In the North of England, which is the most important pig-iron center, the trade has been and continues much depressed, sales in Middlesboro' being limited in amount and at prices hardly covering the cost of production. The price of pig iron has been gradually falling for the past year, the latest quotations for Middlesboro' No. 1 foundry pig being 41/-, or a trifle over \$10, as against 43/6 a year ago. Though these figures show but a small decline, it must be remembered that the comparatively small difference of 2/6 at the present low prices is by no means an insignificant amount. The condition of affairs at the North is most unsatisfactory, as was shown at a meeting of delegates of the Cleveland blast furnacemen a few weeks ago, at which was submitted the following resolution to be presented at the trades union conference held in Aberdeen: "That it is desirable 'there should be a federation of all trades 'unions, with a view to regulating the hours 'of labor, and, if possible, to prevent over-production, which has caused so much 'poverty and distress in the past.' The Eaton Works, in the Cleveland district, which were recently temporarily reopened, had been previously closed for several weeks. Messrs. Bolckow, Vaughan & Co. are taking advantage of the forced cessation of work to make extensive alterations, including the addition of four Siemens furnaces

and a steel mill for treating the product. The reason of this change is said to be the severe depression in the steel-rail trade, making necessary some other outlet for their product. In South Staffordshire there is some little evidence of vitality in the pig-iron trade, owing to the fact that buyers, thinking that bottom prices have been reached, are taking the opportunity to lay in stock, but reports do not indicate that such action is very extensive. What trade there is in bars in the same district is attended with little or no profit, the manufacturers living in the hope that relief will eventually be afforded. In North Staffordshire the pig-iron trade is a little less dull, but, nevertheless, stocks are constantly increasing. In bar iron the trade is also very dull, though prices remain practically unchanged. Staffordshire ordinary marked bar is quoted at £7. 10/-, which is about the same figure that it was sold at a year ago. In Sheffield the trade appears to be in no better condition than in other districts, the prices of steel being such as to hardly pay for its manufacture. Rails are now selling at from £4. 15/- to £4. 17/- per ton, which is a considerably lower figure than was reached 12 months ago. The only trade that gives any evidence of activity in Sheffield is in armor plates and heavy ordnance. It is reported that a Sheffield manufacturer attributes at least some of the distress to the want of enterprise shown by the home firms, who, in many instances, are suffering from foreign competition, a number of English orders being filled at German, Belgian and other Continental works. An innovation worthy of notice that has been brought about by the absence of demand for the products of the Bessemer steel-makers is the competition that has arisen in the Sheffield market between best Bessemer and common cast steel, steel of the former kind, of guaranteed temper, such as is suitable for medium-class cutlery, being now obtainable for £6. 15/- per ton, as against £12, which six years ago had to be paid for cast steel used for the same purpose. Turning to Scotland, we find the prospect no brighter than elsewhere. Notwithstanding the fact that 20 blast furnaces have been shut down during the past year, leaving only 94 furnaces in blast at present, the production of pig iron is still more than enough to supply the demand. Warrants are now selling at about 41/7, as against 47/- at a corresponding date last year, and even with this reduction in price of over \$1.25 per ton the stock in Connal's stores at Glasgow has increased from about 584,000 to 587,000 tons the past 12 months. The ship-building industry, which is such an important factor in Scottish trade, does not show any prospect of a revival. The returns of vessels launched on the Clyde up to the 1st of August were 162,551 tons, against 224,886 tons in 1883, but the figures of vessels on the stocks were 100,000 tons less than for the same date a year previous. Some few good orders have been booked by the Clyde builders, which were, however, solely due to the exceptionally low prices at which contracts can be made, and not because of any demand for more shipping. It is a rather curious fact that, notwithstanding the general desire for increased activity in the ship-building trade, there are many who, because of the present unremunerative freight rates, do not anticipate such revival as an altogether unmixed blessing.

Crossing the Channel we find the same general condition of the iron and steel trades existing on the Continent, though in some countries the depression is not so seriously felt; in fact, Austria has been peculiarly exempt from the prevailing stagnation. The condition of the French market is reported as being very unsatisfactory, the orders received being small in amount and the prices low. Statistics show that the French imports of iron and steel during the first five months of the year were some 33 per cent. below those for the same period in 1883, while the imports of iron ore also show a large decrease. The price of puddling pig is quoted at 5.4 francs per 100 kg. or about \$10 per ton, which is lower than last year. Merchant bar is selling at 15 francs per 100 kg. (\$30 per ton), against 17 francs for same date a year ago. The condition of the iron and steel trades of Germany is not such as would warrant any hopes of renewed activity, though the steel trade is not quite as unpromising as the iron. The stocks of Westphalia pig iron are very large and the prices are reported as below the quotations of 1879. The exports are less than last year and prices are steadily declining. Puddling pig iron is quoted at 54 marks per ton (less than \$13), which is 4 marks per ton cheaper than a year ago. Merchant iron has also declined in price, being at present about \$25 per ton. In Austria, as we noticed above, the state of the trade is decidedly better, though in some cases fresh orders are not coming in as fast as the manufacturers would desire. With but few exceptions the Austrian trade in iron and steel was very satisfactory during last year; in fact, the production in 1883 was ahead of any year since 1873. There have been various causes assigned for this activity, but it appears more than probable that the country is largely indebted for its present prosperity to the increased tariff of 1882. Sweden is also doing a fair amount of business in iron and steel, for though prices continue low, the tables of exports for the first six months of this year show an improvement over 1883. Passing to Belgium, however, we find the condition of the iron and steel trades not materially better than

with her neighbors, France and Germany, the statistics published of the iron trade for the first half of the year testifying to the common depression.

It may prove of interest in connection with this brief review of the state of the iron and steel trades abroad to draw attention to some of the statistics just published by Mr. Jeans in his semi-annual report of the British iron and steel trades. The production of Bessemer steel ingots during the half-year ending June 30, 1884, is 637,843 tons, the total last year's product being 1,553,380, which is considerably more than double the first figure. The corresponding products of Bessemer steel rails for the same periods are given as 426,415 and 1,097,174 tons. Though the latter numbers in both cases represent the yearly product, while the former are for only six months, it will be readily seen that there has been a very marked falling off in production. On consulting the statistics, as presented in greater detail in the report, the decrease is found to be especially large at Sheffield, where at present only three concerns are running their rail mills. The make of pig iron for the first half-year of 1884 is 3,991,220 tons, as against 4,138,225 tons during the same period in 1883, which shows a decrease for the present year of 147,005 tons, the decrease in the Cleveland district alone being not far from 100,000 tons in a total half-yearly product of 1,280,000 tons. The amount of pig iron held by makers and in warrant stores on June 30 was 1,425,343 tons, which is more than 10,000 tons greater than was in stock at the same date of 1883, and 15,000 tons above the amount held on January 1 of the present year. These last figures present evidence of a decreased output which would under ordinary conditions of trade be antecedent to an enhanced demand and more remunerative prices, but thus far there are no indications that such a result will ensue.

After the Anzin Colliery Strike.

The recent great strike at the collieries at Anzin, France, presented some very interesting facts. In the first place, it was one of the few great strikes of recent years in France. For many years combinations of workmen were forbidden by law, and it has only recently been possible for workmen to unite as to present anything like a solid front to the manufacturers or operators, and thus have any prospect of success through a strike. The Anzin strike, which was one of the best organized and most persistently fought, probably, of any strike in France since the great outbreak at Crenot, resulted in the utter defeat of the workmen. This is likely to act as a preventive to strikes in the future, not only among the Anzin miners, but also among colliers in other districts.

As a result of this defeat the miners' association in the Anzin district, which was one of the strongest of French trades unions, is in serious trouble. At the time of the strike its membership was 4400 out of 21,000 adult miners in the northern coal-fields, a proportion of 21 per cent. This, to those acquainted with the strength of unions relative to the entire number of workpeople, will seem a very fair proportion. But since the disastrous termination of the strike the number has been falling off, until now there are but 1820 members, or only 8.07 per cent. Two-thirds of the members have shown their disapproval of the strike by withdrawing from the association; but the defeat of the association and its waning numbers have brought about a remarkable proceeding. The miners were compelled to obtain provisions on credit, and the debts so contracted have not yet been paid off. To test the responsibility of the miners' association, which was responsible for the strike, a dealer has brought an action at law against the secretary for payment of the amounts owing to him by members of the association, and the court has rendered a decision in his favor. If this is the law we imagine that the officers of French unions will in future be sure they are right before they give the order to go ahead.

We print on this page a compendium of the reports received in reply to the last circular sent out by Messrs. George H. Hull & Co., asking for definite responses to the question whether those to whom they were sent would agree to bank or blow out their furnaces upon the terms already known to our readers. Of the furnaces represented by owners agreeing to restrict production—92 in all—we find that 69 are already out of blast and are willing to agree to remain out for periods longer or shorter, according to what may be assumed to be their present expectations, should no agreement be reached. As good business policy would dictate continued idleness to those who are already idle, their consent to participate in the scheme to reduce production is without special significance. There is nothing in the present situation to warrant the blowing in of a furnace which may be out, and it is safe to assume that nothing will occur within the next six weeks or two months so to change the conditions as to encourage very much increase of production. We may assume, therefore, that, whether the owners of idle furnaces say so or not, they can be counted on as involuntary participants in the scheme proposed. Fourteen owners who are now making more or less iron agree to restrict by blowing out or banking, according to circumstances. This is significant, and shows the drift of opinion in the trade very much better than the responses of the owners of idle furnaces can

be assumed to do. Of those who decline to enter into any agreement, 11 flatly refuse for reasons of their own to join any movement of the kind. Three are under contract for the delivery of the iron they are making; three consume their own furnace product and need it; two are using anthracite fuel and could not bank if they would, and one has the straightforward honesty to say that he does not believe in that method of correcting the evils which at present afflict the trade. Several others make somewhat indefinite and unsatisfactory replies, but may safely be classed among those refusing. From this we think it may be asserted with confidence that the scheme has not made much headway. However, as the number of those from whom these reports come represent but a small fraction of the furnace owners in the United States, the outlook for the movement may be somewhat changed when the others are heard from, if, indeed, they ever are.

An uneasy feeling exists in the anthracite coal regions of Pennsylvania, caused by the apprehension that the notorious brotherhood of Mollie Maguires is again being revived. This secret society, composed of miners and laborers, was at one time a very powerful organization, and the deeds of bloodshed committed by its agents crimsoned the Keystone State from near the northern border almost to the boundaries of the capital. Its former suppression is due to the efforts of Franklin B. Gowen, then the president of the Philadelphia and Reading Railroad Company, who courageously undertook the work of stamping out of existence this infamous organization, whose principal object seemed to be murder. Not only were obnoxious mine owners and mine superintendents "removed" by the society's agents, but prominent citizens of mining towns were numbered among its victims. The leaders aspired to be politicians also, and several counties felt the weight of the Mollie Maguires in their local elections, important offices being not infrequently filled by members of the order. This condition of affairs was fast becoming a terrible grievance to the good citizens of the coal regions, but Mr. Gowen freed them from the incubus by securing reliable testimony against a large number of those Mollie Maguires who had either ordered or committed murders. In the neighborhood of 30 were hanged, the order was completely broken up, and for over five years there has not been a suspicion of its revival until now. While there is no direct evidence to connect the Mollie Maguires with recent murders, circumstances certainly direct suspicion toward them, and the recent mysterious incendiary burnings of colliery property in different sections of the coal country are attributed to the brotherhood. It is said that detectives have ascertained also that prominent officers of the coal-mining and coal-carrying companies have been black-listed, and their murder set down for the early future. With a full knowledge of the heinous misdeeds of this infamous order during its former period of existence, the Pennsylvania authorities will merit severest condemnation if they do not check any and all attempts at its revival.

Observing a statement in an exchange to the effect that the Juragua iron ore recently received from Cuba by the Bethlehem Iron Company contained an average of only 63 per cent. of iron, with considerable sulphur, we addressed a letter of inquiry on the subject to Mr. Alfred Earnshaw, of the Juragua Iron Company, Philadelphia, who responds as follows:

We had 1000 tons of ore at Perth Amboy some time ago from Cuba, which the Bethlehem Iron Company have used. The ore was shipped practically before our road was opened, and was surface ore from one of the mines, of which we have some 3000 to 4000 tons to ship. It is somewhat lean in iron—that is, while over 60 per cent., it was not up to our standard of 67 per cent., and it does contain some sulphur. As it is really not our regular grade of ore, we have not paid much attention to this shipment. We expect a steamer in here on Monday, which I think will bring our regular grade of ore. This is going to the Pennsylvania Steel Company.

As it is probable that large quantities of Cuban ore will be shipped to this country, further information about it, as well as about the pig iron made from it, will be awaited with interest.

A reporter of the Philadelphia Public Ledger has recently investigated the subject of the cost of living now, as compared with 30 years ago. His inquiries have brought him into contact with old housekeepers and storekeepers and representatives of various trades and crafts, whose recollections cover the past quarter of a century, and his report occupies about a column of the journal referred to. The details are interesting, and he concludes that, taking all things together, it costs considerably more to live now than it did 25 or 30 years ago. Wages in nearly all the trades are considerably higher than they were then, yet it is believed that a family spends more than the increase in the wages of its head in housekeeping nowadays; whereas, perhaps, if he lived as his forefathers did, the difference would not be so noticeable.

The following announcement from an Havana exchange is significant with respect to the present condition of the sugar industry in the island of Cuba: "Twelve sugar estates and farms, with an aggregate value of \$601,616.41, have already been announced to be sold at auction during present month by order of the courts." From the effects of

excessive taxation and protracted misgovernment Cuban industries of every form are prostrated as never before within a long period. Bankruptcy is almost universal, and the condition of the mercantile classes is such as to stir up the sympathies even of the Imperial Government for their relief. There is no need of a commission to consider the expediency of selling the island to the United States, or anything of the sort, but American citizens as individuals may see the opportunity for successful investment.

The Scheme to Restrict Production.

The following is an abstract of the replies received to the last circular issued by Geo. H. Hull & Co., of Louisville, in reference to the plan to restrict the production of pig iron. The annual capacity of each plant is given, together with the name of the plant and that of the owner. The replies are in answer to the question, "How will you agree to restrict the production of pig at your furnaces within the next six months?"

AGREEMENT TO RESTRICT.

Maine.

Katahdin Furnace, Katahdin Furnace Company, 6000 tons.—"By not blowing in before January 1."

Vermont.

Titan Furnace, Naylor & Co., 4000 tons.—"By not running during next 6 months."

New York.

Elmira Furnaces, Elmira Iron and Steel Rolling Mill Company, 35,000 tons.—"By remaining out for 2 months."

Furnaceville Furnace, Furnaceville Iron Company, 10,250 tons.—"By remaining out during next 6 months."

Jagger Furnaces, Jagger Iron Company, 25,000 tons.—"By remaining out until January 1."

Onondaga Furnaces, Onondaga Iron Company, 36,000 tons.—"By remaining out until better prices obtain."

Alpine Furnace, Z. N. Benton, 7300 tons.—"By remaining out until July, 1885."

Copake Furnace, Frederick Miles, 4500 tons.—"By remaining out 30 days longer."

Millerton Furnace, Millerton Iron Company, 4500 tons.—"By remaining out until November 1."

Manhattan Furnaces, Manhattan Iron Works Company, 18,000 tons.—"By keeping one furnace idle for 2 months."

Wassaic Furnace, N. Gridley & Son, 4000 tons.—"By remaining out until prospect improves."

New Jersey.

Port Oram Furnace, Joseph Wharton, 16,000 tons.—"By remaining out 2 months."

Warren Furnace, Joseph Wharton, 15,000 tons.—"By remaining out 2 months."

Pennsylvania.

Emaus Furnace, Ormrod, Fisher & Co., 15,000 tons.—"By remaining out balance of year."

Lehigh Furnaces, Lehigh Iron Company, 28,000 tons.—"By remaining out for at days."

Chester Furnace, Chester Rolling Mills, 36,500 tons.—"By remaining out at least 3 months."

Montgomery Furnace, Montgomery Iron Company, 12,500 tons.—"By remaining out until January 1, 1885."

Moslem Furnace, Leibrandt & McDowell, 8000 tons.—"By remaining out for 6 months."

Norristown Furnace, James Hooven & Son, 10,000 tons.—"By remaining out of blast."

Glamorgan Furnaces, Glamorgan Iron Company, 16,000 tons.—"By remaining out until March, 1885."

Union Furnace, Beaver, Marsh & Co., 7000 tons.—"By banking and running at reduced capacity 3 weeks."

Cameron Furnace, Cameron Furnace Company, 9000 tons.—"By remaining out of blast."

Lochiel Furnace, Lochiel Rolling Mill Company, 7500 tons.—"By remaining out of blast for 3 months."

Atlas Furnace, Red Run Coal Company, 4000 tons.—"By delaying blowing in."

Mahoning Furnace, Wesley Wilson & Co., 5000 tons.—"By delaying blowing in."

Charlotte Furnace, Charlotte Furnace Company, — tons.—"By remaining banked 30 days."

Edith Furnace, Manchester Iron and Steel Company, 32,500 tons.—"By remaining out 6 months."

Erie Furnace, Rawle, Noble & Co., 10,000 tons.—"By remaining out of blast."

Sharon Iron Company's Furnaces, Sharon Iron Company, 24,000 tons.—"By banking one furnace from 1 to 2 months longer, and by keeping one out indefinitely."

Sharon Furnace, Boyce, Rawle & Co., 10,000 tons.—"By keeping furnace banked at least 4 weeks."

Stewart Furnaces, Stewart Iron Company, 50,000 tons.—"By keeping one stack idle for from 2 to 3 months."

Berlin Furnace, Jackson Iron Company, 3000 tons.—"By remaining out of blast."

Carlisle Furnace, C. W. Ahl & Son, 4800 tons.—"By remaining out 5 months."

Falling Spring Furnace, C. Burkhardt & Co., 3000 tons.—"By remaining out until business shall be profitable."

Franklin Furnace, Hunter & Springer, 1500 tons.—"By remaining out at least 4 months."

Logan Furnace, Valentines & Co., 4000 tons.—"By remaining out of blast."

Virginia.

Amberst Furnace, Wm. H. Jordan, 2500 tons.—"By remaining out 6 months."

Cave Hill Furnace, R. Sayers & Co., 3500 tons.—"By blowing out in December and remaining out until trade improves."

Mine Run Furnace, John C. Karsten, 3000 tons.—"By remaining out of blast."

Van Buren Furnace, Frank King, 2500 tons.—"By remaining out until spring."

Victoria Furnace, Iron and Steel Works Association of Virginia, 30,000 tons.—"By banking at sufficient intervals to aggregate 30 days, or by delaying going into blast."

West Virginia.

Belmont Furnace, Belmont Nail Company, 18,000 tons.—"By remaining idle 3 months or more."

Top Mill Furnace, Wheeling Iron and Nail Company, 25,000 tons.—"By remaining banked for 4 weeks."

Riverside Furnace, Riverside Iron Company, 26,000 tons.—"By banking October 1, 1884."

Capon Furnace, Keller & Co., 1500 tons.—"By remaining out until April, 1885."

Kentucky.

Licking Furnace, Swift's Iron and Steel Works, 17,000 tons.—"By blowing out or banking."

Red River Furnaces, Kentucky River Iron Manufacturing Company, 10,000 tons.—"By remaining out of blast."

Raccoon Furnace, Raccoon Mining and Manufacturing Company, 4000 tons.—"By remaining out of blast."

Tennessee.

Oakdale Furnace, Oakdale Iron Works, 21,000 tons.—"By remaining out until prices materially improve."

Roane Furnaces, Roane Iron Company, 30,000 tons.—"By blowing out one furnace for 60 days."

Georgia.

Etna Furnace, Jno. E. Stillwell, 35,000 tons.—"By blowing out in December and remaining out perhaps until spring."

Cherokee Furnace, Cherokee Iron Company, 11,000 tons.—"By delaying blowing in until after January 1, 1885."

Alabama.

Edwards Furnace, Edwards Iron Company, 11,000 tons.—"By remaining out for 60 days."

Sloss Furnaces, Sloss Furnace Company, 60,000 tons.—"By delaying blowing in No. 2 furnace until October 15. Will co-operate fully if movement is universal."

Woodstock Furnaces, 15,000 tons.—"By keeping one furnace out 4 or 5 weeks and reducing blast."

Ohio.

Bloom Furnace, J. D. Clare & Co., 3000 tons.—"By blowing out for 3 months."

Buckeye Furnace, Buckeye Furnace Company, 5000 tons.—"By blowing out."

Buckhorn Furnace, Campbell, McGugin & Co., 3000 tons.—"By remaining out until prices improve."

Oliver Furnace, Campbell, McGugin & Co., 4000 tons.—"By banking for three months."

Hecla Furnace, Hecla Iron and Mining Company, 3500 tons.—"By delaying blowing in 1 month."

Logan Furnace, Logan Iron Company, 3000 tons.—"By remaining out 6 months."

Belfont Furnace, Belfont Iron Works Company, 15,000 tons.—"By blowing out or banking for from 30 to 40 days."

Eliza Furnace, Eliza Coal and Iron Company, 6000 tons.—"By remaining out of blast."

Ironton Furnace, New York and Ohio Iron and Steel Company, 17,500 tons.—"By remaining out until December 15, 1884."

Milton Furnace, Milton Furnace and Coal Company, 8000 tons.—"By remaining out of blast 6 weeks."

Tropic Furnace, Tropic Furnace Company, 5500 tons.—"By remaining out of blast 6 months."

Sarah Furnace, H. Campbell & Sons, 10,000 tons.—"By remaining idle for 6 months."

Wellston Furnaces, Wellston Coal and Iron Company, 7300 tons.—"By delaying blowing in until October 1. Will then have been idle 7 weeks."

Hamilton Furnace, Means, Kyle & Co., 10,000 tons.—"By remaining out."

Cherry Valley Furnaces, Cherry Valley Iron Company, 40,000 tons.—"By keeping one furnace out of blast."

Brier Hill Furnaces, Brier Hill Iron and Coal Company, 90,000 tons.—"By blowing out largest furnace for 6 weeks and keeping out of blast two others now idle."

Eagle Furnace, Eagle Furnace Company, 17,000 tons.—"By remaining out of blast 3 months."

Girard Furnace, Girard Iron Company, 20,000 tons.—"By remaining out until November 10, 1884, unless we need metal for our own mill."

Hubbard Furnaces, Andrews & Hitchcock, 45,000 tons.—"By banking furnace at any time when we have iron on yard to supply our regular customers."

Fannie Furnace, Licking Iron Company, 13,000 tons.—"By blowing out one furnace and by keeping one out of blast."

Akron, Bessie, Crafts, Thomas and Winona Furnaces, Columbus and Hocking Coal and Iron Company, 50,000 tons.—"By delaying blowing in for 1 month."

Franklin Furnace, King, Gilbert & Warner, 12,000 tons.—"By remaining out of blast for 6 weeks."

Dover Furnace, Penn Iron and Coal Company, 15,000 tons.—"By banking for 2 months."

Zanesville Furnace, Ohio Iron Company, 18,000 tons.—"By remaining banked until November 1, 1884."

Indiana.

Vigo Furnace, Vigo Iron Company, 8000 tons.—"By remaining out of blast."

Brazil Furnace, Central Iron and Steel Company, 10,000 tons.—"By remaining out about 2 months."

Illinois.

Big Muddy Furnace, Lewis Iron Company, 15,000 tons.—"By remaining out of blast."

Calumet Furnace, Calumet Iron and Steel Company, 45,500 tons.—"By remaining out until May, 1885."

Missouri.

Jupiter and Vulcan Furnaces, St. Louis Ore and Steel Company, 88,000 tons.—"By remaining idle certainly until January 1, 1885, and perhaps until March 1, 1885."

Michigan.

Leland Furnace, Leland Iron Company, 9000 tons.—"By blowing out about October 1, 1884."

Martel Furnace, Davenport, Fairbairn & Co., 16,500 tons.—"By blowing out to remain out."

Pine Lake Furnace, Pine Lake Iron Company, 15,000 tons.—"By blowing out on October 1 and remaining out until spring."

Eureka Furnaces, Eureka Iron and Steel Works, — tons.—"Will agree with others under arrangement proposed."

Wisconsin.

Fond du Lac Furnace, Fond du Lac Iron Company, 10,000 tons.—"By remaining out of blast."

Green Bay Furnace, National Furnace Company, 8000 tons.—"By remaining out of blast."

Texas.

Lou-Ellen Furnace, Marshall Car-Wheel and Foundry Company, — tons.—"By remaining out of blast 3 months."

Colorado.

Colorado Furnace, Colorado Coal and Iron Company, — tons.—"By banking for at least 4 weeks."

NOT AGREEING TO RESTRICT.

New York.

Sterling Furnaces, Sterling Iron and Railway Company, — tons.—"We would not care to join in restriction unless it was a mutual and several agreement on part of various furnaces of country."

New Jersey.

Chester Furnace, W. J. Taylor & Co., — tons.—"Have been idle 4 months; will enter no agreement now."

Pennsylvania.

Bloom Furnace, Wm. Neal & Son, — tons.—"Are running on anthracite and cannot bank."

Ironton Furnaces, Bloomsburg Iron Company, — tons.—"Cannot bank; furnaces not calculated for so doing; may blow out soon, however."

Lackawanna Furnaces, Lackawanna Iron and Steel Company, — tons.—"We do not make pig to sell, but consume our entire product."

Chickies Furnaces, Chickies Iron Company, — tons.—"Decline to enter agreement."

Colebrook Furnaces, Robert H. Coleman, — tons.—"Are under contract."

Paxton Furnaces, McCormick & Co., — tons.—"Will not blow in until November 1, but decline to bind ourselves to any line of action."

Neshannock Furnace, Crawford Iron and Steel Company, — tons.—"Have been stopped 6 weeks. Will make no promises."

Pioneer Furnaces, Pottsville Iron and Steel Company, — tons.—"Use all our own product."

Mont Alto Furnace, G. B. Wiestling, — tons.—"Have delayed blowing in 5 weeks."

Virginia.

Crozer Furnace, Crozer Steel and Iron Company, — tons.—"President absent and can take no steps toward restricting production."

West Virginia.

Ironton Furnace, J. Nemegyei, — tons.—"Cannot agree."

Alabama.

Woodward Furnace, Woodward Iron Company, — tons.—"Cannot see it to our interest."

Ohio.

Star Furnace, Star Furnace Company, — tons.—"Do not believe it the proper way to regulate prices."

Anna, Falcon and Phoenix Furnaces, Brown, Bonnell & Co., — tons.—"We use all our pig, and it is impossible for us to say when we can bank our furnaces."

Mary Furnace, Ohio Iron and Steel Company, — tons.—"Are under contract."

Jefferson Furnaces, Jefferson Iron Works, — tons.—"Decline to agree."

Pine Grove Furnace, Means, Kyle & Co., — tons.—"Will not stop on account of large amount of charcoal on hand."

Mt. Vernon Furnace, H. Campbell & Co., — tons.—"Will make only 1000 tons during next 6 months."

Wisconsin.

National Furnaces, National Furnace Company, — tons.—"Are working on contract."

A Geyser in Broadway.—The pipes of the New York Steam Heating Company supply the building No. 191 Broadway, New York, at the corner of Day st., with heat and power. For a distance of 10 feet the pipes are exposed where they run under an iron stoop into the cellar. The floor of the basement is occupied by the Brooklyn Fire Insurance Company. At 2 o'clock in the afternoon of the 16th inst., while the street was crowded with pedestrians, a hissing noise was heard, and the next moment a volume of steam rose in the air. One of the stop-cocks had been blown off by the unusual high pressure. The clerks of the insurance company rushed out into the street hatless, and the pedestrians scattered in every direction; horses reared and became terrified. Then a loud report was heard and the building was shaken. Everything was confusion, and the occupants, thinking it was an earthquake, deserted their desks and fled for safety. An immense volume of water and steam, like a picture of one of the geysers in Iceland, rose into the air to the height of 40 feet, while smaller geysers spouted from the open spaces in the iron stoop. Fortunately no one was on the stairway at the time of the explosion. It is more than likely that the force of the spouting steam would have carried everything before it. The grand sight attracted thousands to the spot, and for over an hour traffic was blocked. For a time excitement and terror reigned supreme, but when the frightened people saw that the phenomenon was attended by no serious results they became calm, and after a time visited the spot and gazed upon the steam. The necessary repairs were made before night.

An Associated Press dispatch says that a notice is posted in the works of the E. & G. Brooke Iron Company, of Birdsboro, Pa., of a 10 per cent. reduction in the salaries and wages of the employees except the day laborers. The reduction

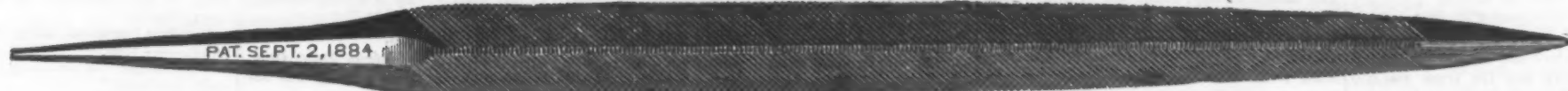
NEW AMERICAN FILE CO., PAWTUCKET, R. I.

MANUFACTURERS OF

FILES AND RASPS.



CUT BY OLD METHOD.



PATENT IMPROVED CUT.

To all whom it may concern:

There has been just cause for complaint at the edges of the Three-Square Files breaking down. Every manufactory in the country makes Three-Square Files by the same method, and every user of the Three-Square File is aware that their edges have always been defective. With these facts in view, we present to the public a Three-Square File whose edges are as strong as its sides.

The mode of manufacturing these PATENT Three-Square Files is very simple of itself; still, those who have used them will affirm that they will do twice, and some even four times, as much work as any Three-Squares they ever used.

See below names of Representative Corporations, Firms and Individuals who have used and reported upon this improved Three-Square Saw File. We do not claim that the superiority of this PATENT Three-Square is the result of any Hocus Pocus process, as any mechanic can see at a glance that from the mechanical construction of its edges it must of a necessity do more work than any file of its kind ever before offered to the public.

To the dealer this file will yield a handsome profit, and to the consumer One Hundred per cent. advance in price would not warrant buying any other file of its class.

We warrant every file to do twice the work of any other Three-Square Saw File that can be produced, "either Foreign or Domestic." BEWARE OF IMITATIONS.

Write for Sample Lot, Price and Terms.

March 19th, 1884.
The Files are the best and the principle perfectly right. Our Foreman claims he can file three times as many band saws with your File as any other.
P. H. SKIDMORE & SONS, Bridgeport, Conn.

March 18th, 1884.
One carpenter says he filed his saw eleven times with one File and it was good for two more.
P. D. CONANT & CO., Hardware, Fall River, Mass.

January 22d, 1884.
We gave the File to the man having the hardest work for such Files, and he is satisfied it will do the work of two double-end Files, and he thinks it will do as much on hard steel as four double-enders. The File scarcely shows signs of wear.
R. BLISS MFG. CO., Pawtucket, R. I.

March 24th, 1884.
Your Files are the best I ever used, and will do twice as much work.
L. POWER & CO., 20 So. 23d St., Philadelphia.

March 28th, 1884.
The Files are the best and the principle is right. One man filed more saws with one edge than he could with the three edges of any other File we ever used.
JOHN M. SMITH & SONS, 1423 Spring Garden, Philadelphia.

March 18th, 1884.
The File is a very good one in regard to corners. With one corner have filed three saws. Our saws have to be very hard to saw soapstone slabs.
PHILADELPHIA SOAPSTONE WORKS, Philadelphia.

March 23d, 1884.
The Files are the best. Will file three times as many saws as other tapers. Our saw man did not want to use it. Said he knew all about those things, but owned up like a man after he had tried it.
SWEET MFG. CO., Syracuse, N. Y.

March 22d, 1884.
The Files are the best and the principle is right. Have used Files for 35 years. Yours are the best of all.
E. P. SIDELL, No. 5 Chant St., Philadelphia.

February 8th, 1884.
The Files are the best. For Band Saws there is no better. Filed ten Band Saws with one File.
WILMARTH & MACKILLIP, Pawtucket, R. I.

March 27th, 1884.
The Files are the best and the principle is right. If this is a sample of File you intend to make, you will have a good market in Philadelphia for them.
DANIEL L. LARLEY, Philadelphia.

March 6th, 1884.
The Files are the best. One side of the File you left with me for trial has sharpened two circular saws, 12 in. diameter, and four hand saws, "hard ones," and my Foreman says it is the best File he ever used.
JOHN ORTTON, M. M., N. Y. C. & H. R. Co., West Albany, N. Y.

February 1st, 1884.
The Files are the best. Have filed eighteen saws with one File.
R. L. DARLING, Fall River, Mass.

April 15th, 1884.
File is good; Principle right. Would recommend them in preference to any other. I think they will file two to three times as many as any other.
125 Albany St., Boston, Mass.

April 4th, 1884.
The File we used was pronounced first class, and did do twice as much as an ordinary taper.
SPRING PERCH CO., Bridgeport, Conn.

April 4th, 1884.
I filed all my saws, which was five, with one corner; the last was better than the first. I thought I had better stop, as I should never need another File.
41 N. 7th St., Philadelphia.

March 20th, 1884.
The Files are the best; the principle is right. Send me one dozen 5-inch Skin Taper and one dozen 8-inch Mill.
H. E. HUBBARD, Hartford, Conn.

January 30th, 1884.
The Files are the best I ever used, and I use them extensively. Filed fourteen saws with one File.
IVORY T. LOWE, Fall River, Mass.

January 25th, 1884.
The Files are the best.
SIMONDS MFG. CO., Fitchburg, Mass.

January 4th, 1884.
We are of the opinion they will file five times as many saws as any other File, and in future will use no other.
R. H. SIMMONS & SON, Central Falls, R. I.

Pawtucket, R. I.

T. C. Barnes, Pawtucket Steam & Gas Pipe Co., H. W. Shaw, Chas. T. Hopkins, J. R. Beinfeld, M. M., H. M. Bowditch, H. N. Reed & Co., J. S. Capron, Pawtucket Hair Cloth Co., R. I. Cardboard Co., R. Bliss Manufacturing Co., Union Wadding Co., J. S. White, R. H. Simmons & Son, D. W. Southwick, George Robinson, T. D. Rice & Co., Central Falls Wooten Co., O. H. Smith, Fales & J. nks Machine Co., James Brown, W. J. Hood, Weatherhead, T. & Co., Slater Cotton Co., J. T. Cottrell, American Supply Co., Geo. W. Arnold, Wilmarth & McKillop, D. A. Kelley, Frank Lambart, Dempsey Bros., J. O. Draper & Co., Greene & Daniels Mfg Co.

New York.

F. A. Balaz, L. H. Hoffman, D. Morrissey, M. L. Kenney, Chas. West, Chas. B. Many, Wm. Y. Yarnand, Samuel Tyrrell, James A. Allen, Michael Joyce, Henry Eggert, George Barrow, Thos. S. Reisman, Frank R. V. heaton, Wm. H. Connelly, A. Kimball & Son, James Fee, W. McDonough, F. A. Seighard, Joseph Cabus, Freehold Tool Works, F. Mahitadt, John Jennings, S. Protache, Thomas Keegan, George May, Joseph Darwent, H. Mandeville & Son, Howland & Lein, D. Dode, P. Prybill, E. Lewis, Wesner Bros., J. P. Ryan, James H. Taiman, John L. Carr, John Croak, Geo. Stock, G. Ryerson, F. Freeland, G. Schoonmaker, Ed. J. Holden, John Kirscher, Woodruff, Renkin & Bayer, E. H. Hinners, J. Dimot, J. M. Brunswick & Balke Co.

Jersey City.

B. F. Cordman, James Rafter, John H. Rafter, Stephen Richards, Chas. H. Pullis, Robert Hood, Fax & Whitour, M. Farley.

Boston, Mass.

M. Cushman, J. Whitehead, T. P. Margerson, Rowell O'Brien, H. Helmhold, D. W. Hurd, Frank Sheffield, Edward C. Nichols, Moser, Hammond & Son, Charles Fuller, I. M. Do loff, T. F. Brown & Co., C. Sullivan, J. E. Joselyn, George E. Weber, P. W. Case, T. H. Reynolds, R. O. Dunn, H. H. Wakefield, Alex. B. Pinkham, F. L. Ford, A. J. Stone, Hartford W. W. Matreese Co., Strickland & Shay, John C. Mead, L. B. Moody, W. M. Clark, W. E. Dester & Co., E. A. Lane, H. N. Jones & Co., C. H. Roberts, Pratt & Whitney Co., Barrett Bros., G. P. Farr, H. E. Hubbard,

Hartford, Conn.

F. L. Ford, A. J. Stone, Hartford W. W. Matreese Co., Strickland & Shay, John C. Mead, L. B. Moody, W. M. Clark, W. E. Dester & Co., E. A. Lane, H. N. Jones & Co., C. H. Roberts, Pratt & Whitney Co., Barrett Bros., G. P. Farr, H. E. Hubbard,

Springfield, Mass.

F. M. West, C. H. Annable, Allenson Johnson, Geo. E. Page, H. J. Chandler, Asa C. Woodward, E. S. Stacy, Asa Fisk.

Philadelphia.

Phila. Soap Stone Works, James Buist, Jr., Wm. D. Stride, Aug. Westenberg, R. Robinson, E. P. Sidell, Harry B. Yeager, McCracken, Hawk & Co., John T. Speakman, T. Callahan, James L. Lyle, Wm. H. Shourds, James Dunlap, H. B. Tawresay, D. P. Seipel, George Zippler, John H. Zippler, Theo. Guilmer, Daniel Lazard, John M. Smith & Sons, J. Jacob Shannon, David Gardiner, The Machine Tool Works, D. W. Eisenberg,

Boston Nickel Plate Co.

G. C. Lowe, A. S. Haven, Joseph Woodward, Daniel Canby, A. Cappel & Co., Benj. Merritt, H. G. Henley, Wm. D. Egan, Briggs Bros., W. T. McFarland, James Milligan, Ira C. Bumpas, F. Lothrop, Geo. J. Stevens, W. H. De Lue, J. F. Brown, B. E. Hemmway.

Brooklyn, N. Y.

Wm. D. Kinkade, Thos. Kipler, David H. Williams, Cross, Austin & Co., Samuel Drew, E. F. Herd, Dominick Iefillippi, B. S. Bosard, Wm. Henry Stevens, G. W. H. Andrew, James B. Twiss, Cheselboro, Whitman & G., C. H. Tienout, E. Dawling, John Halby, E. B. Nimmo, M. J. Murphy, Thos. Slagge, John T. Perry, Wm. J. Megram, Philip H. Gill, Thomas Lynch, Cornelius Hoogland, Frank Schmachtenberger, Joseph Lerner, Samuel E. Burdis, Wm. Nicol's Sons, Thomas Singleton, Edward Morton, Bishop Bros., G. & C. Pasfield, Henry A. Rogers, Riley & Cowley, J. Hodgson,

Woonsocket, R. I.

B. S. Darling, J. E. Bradford, Wm. H. Braxton, Wm. H. Bixter, Mathew Marty, J. McCloskey, M. M., Chas. Berard, John Dixon, D. S. Fuller, D. S. Richardson,

Bristol, R. I.

Herreshoff Mfg. Co., Ramquist Mills.

Syracuse, N. Y.

Sweets Mfg. Co.

Fall River, Mass.

I. P. Lowe, J. E. Shaw, Wm. H. Brady, John H. Chalk, N. P. Tillson, T. T. O'Keefe, J. T. Jones, Barnard Manufacturing Co., Wm. Kirkor, H. N. Darling, Wm. Prosser, Joseph F. Martel, Peter Noy, E. M. Pierce, Daniel Gladding, Ely Morell, F. S. Bliffins, John Tomlinson, Chas. H. Hodgson, Henry D. Damon, W. R. Smith, P. D. Conant & Co., Philip Grinnell.

Taunton, Mass.

W. H. Chace, Wm. W. Davis, Nathan Rand, Eugene P. Bassett, F. R. Washburne, Emerson Babbitt, E. W. Strange, Everett Fuller, Peck & White, F. A. Bliss, Whittemore Mfg. Co., Chace R. Pierce.

Bridgeport, Conn.

Wm. H. Playfoot, Lewis F. Ward, G. Keenan, P. H. Skidmore & Sons, Talbot Barlow, Geo. F. Barlow, O. S. Platt & Co., Spring Porch Co., The Elwell & Kean Mfg. Co., Leonard Pratt, The Wales Wheel Co., W. H. Cuts, Jr., W. M. Harris, J. E. Shaw.

New London, Conn.

T. E. Beach, Albertson & Douglas M. Co., Geo. A. Richards, W. H. Burdick, John A. Comstock, Reeves & Kelly, Geo. R. Miller, Geo. W. Rogers, John G. Butler, Jos. L. Roubey.

Westerly, R. I.

Albert S. Maine, C. W. Willard, A. A. Stillman, G. B. Hiscok, Herbert T. Kenyon, James A. Horton, Chas. B. Barker.

New Haven, Conn.

A. D. Tyrill, W. G. Shepherd & Co., John J. Dinman, Clark & Boardley, New Haven Clock Co., Thomas Ailing, Brett & Manning, R. Field, E. A. Folsom, Sargent & Co.

New Bedford, Mass.

Samuel T. Bennett, Daniel A. McKimble, Brown & Co., O. Haskins & Co., Orville Haskins, M. P. Kennedy, Brownell, Ashley & Co., Jethro C. Davis, Edward B. Coffin, Mascher & Brownell, C. F. Clark, Wm. A. Kirby,

Providence, R. I.

Albyn Arnold, Cleveland Brothers, George Stewart, R. I. Braiding Machine Co., G. W. Pratt, Supt., Wm. B. Healey, Prov. Saw and Tool Works, A. White, P. & W. R. R. Repair Shop, Barstow Stove Co., Harvey Sewer & Bolt Co., Towel Rack & N. Mfg. Co., Providence Machine Co., Wm. A. Harris, Geo. B. Underwood.

Waterbury, Conn.

L. A. Heimer, James Stovel, James S. Neill, A. S. Jenks, W. A. Brown.

Worcester, Mass.

L. Moore, W. H. Walker, C. H. Rawson, Cutting & Bishop, J. B. Cummings, Jason Putnam, Wetherby, Ruger & R., F. M. Cross, E. C. Smith, J. D. Seagraves, Chas. Clark, Chas. L. Palmer, Horace A. Richardson, Jeremiah Winn, A. Burlingame, H. A. Richardson.

Bridgeport, Mass.

Bridgewater Iron Co., Eagle Cotton Gin Co.,

Pittsfield, Mass.

W. C. Stevenson, Franklin Carpenter, Dennis Blair, Michael Boudoin, Alfred Brock, Chas. H. Hubbard, James Mangano, E. W. Iams, A. F. Gardler.

Bridgeport, Conn.

Wm. H. Playfoot, Lewis F. Ward, G. Keenan, P. H. Skidmore & Sons, Talbot Barlow, Geo. F. Barlow, O. S. Platt & Co., Spring Porch Co., The Elwell & Kean Mfg. Co., Leonard Pratt, The Wales Wheel Co., W. H. Cuts, Jr., W. M. Harris, J. E. Shaw.

New London, Conn.

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Westerly, R. I.

Albert S. Maine, C. W. Willard, A. A. Stillman, G. B. Hiscok, Herbert T. Kenyon, James A. Horton, Chas. B. Barker.

Chester, Pa.

J. Irvin Taylor, Robert Wetherell & Co.

Fitchburg, Mass.

Simonds Mfg. Co.

Manchester, N. H.

R. F. Porter, S. C. Forsaith & Co.

Ansonia, Conn.

J. W. Bogg, E. A. Walker.

Rufus R. Thomas & Co.

Ridgeway Pat. Refrigerator Co. (Limited), P. B. Stines, James S. Simpson, L. Power & Co., G. A. Hoover, Westcott & Thompson, Wm. Thumanger, American Meter Co., H. F. Foster, Andy Will, H. Nicholls, W. D. Burkhardt, C. Kelley, Jacob Rush, Geo. B. Russell, Chas. B. Stroude, Henry Lott.

Troy, N. Y.

N. B. Dutcher, Geo. Vallier, N. B. Gardner, John Gocha, F. N. Barge, Frank F. Salisbury.

Albany, N. Y.

Erastus Ewing, Ed. A. Walsh, Julius Hahn, P. E. Dederick & Co., S. Kleyser, John Scott, Littlefield Stove Co., John Orillon, M. M., Otto N. Hanson, Geo. H. Cheney, John Miller k, C. H. Havens, Eugene H. Harris, Marshall & Wendell, E. McCarnon, Chas. H. Rosner, E. M. Cameron, W. T. Burgess, C. R. Becker, Nicholas Colling.

Bridgeport, Mass.

Bridgewater Iron Co., Eagle Cotton Gin Co.,

Pittsfield, Mass.

W. C. Stevenson, Franklin Carpenter, Dennis Blair, Michael Boudoin, Alfred Brock, Chas. H. Hubbard, James Mangano, E. W. Iams, A. F. Gardler.

Bridgeport, Conn.

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New London, Conn.

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J. W. Bogg, E. A. Walker.

Bridgeport, Mass.

Bridgewater Iron Co., Eagle Cotton Gin Co.,

Pittsfield, Mass.

W. C. Stevenson, Franklin Carpenter, Dennis Blair, Michael Boudoin, Alfred Brock, Chas. H. Hubbard, James Mangano, E. W. Iams, A. F. Gardler.

January 25th, 1884.
Have filed six or seven saws with the sample you left. Good for three or four more.
B. L. DARLING, Woonsocket, R. I.

January 25th, 1884.
The Files are A No. 1. We do not think we ever had a better File in our shop. The sample was splendid.
PROVIDENCE SAW AND TOOL WORKS, Providence, R. I.

January 23d, 1884.
The Files are the best I ever used. Will file three times the saws as other tapers. Please give me address where I can buy a couple of dozen 4 and 4 1/2 inch.
ALBYN ARNOLD, Providence, R. I.

March 4th, 1884.
The Files are the best. I filed two Disston 26 No. 12 and two 26 No. 9 with one corner of your File. I have used one entire File with one of them. I think your Files will do more than Stubbs' of equal length.
C. H. HODGATE, Fall River, Mass.

The Files are the best. The File tested performed as much work as three of the files before used.
W. M. A. HARRIS, Providence, R. I.

February 6th, 1884.
The File is the best. Have filed six buck saws, and is good for quite a number more. Ordinary files file three saws. I think the corners right. Ordinary files crumble off the corners.
NATHAN RAND, Taunton, Mass.

April 3d, 1884.
I cannot express words high enough for they are perfection, both in edge and flat surface. The teeth give a clear cut, throwing the dust clear of the tooth, so disengaging with stopping to wipe the dust from the File. In conclusion, it is the keenest, swiftest and cleanest-cutting File I ever used, and I have used all makes of English files.
W. H. STROUDS, 603 N. 13th St., Philadelphia.

April 2d, 1884.
We have in our employ 12 carpenters, and they have all tried your Files, and they all say it is the best File that has ever been invented. I can say for myself it is perfect. You are at liberty to use our name.
GEO. F. BARLOW, Bridgeport, Conn.

February 8th, 1884.
The Files are the best; the principle is right; will file twice as many saws as other tapers; would recommend them in preference to any other.
AMOS CORNFELL, New Bedford, Mass.

March 4th, 1884.
I never used a File that cut so fast or lasted so long as the sample.
PRATT & WHITNEY CO., C. H. B, Hartford, Conn.

January 31, 1884.
Have filed two saws with one corner and find it wears and don't break down; it is good to file two more saws with the same corner.
T. T. O'KEEFE, Fall River, Mass.

January 31, 1884.
The Files are the best. We had one of our customers we sold one to, come back and buy a dozen.
JOSEPH MARLEY, Fall River, Mass.

January 28th, 1884.
They will file three times as much as any other taper. If quality is kept same as sample will not use any other.
EDWARD C. NICHOLS, Providence St.

I agree to above.
AMOS DOE, Highlands, Boston Mass.

February 17th, 1884.
The Files are the best. We have tried your Files and they are good.
G. SULLIVAN, J. A. JOSSLYN, GEO. WIER, 234 Rutland Ave., Charlestown, Mass.

April 4th, 1884.
The Files are the best and principle right. Will file twice as many saws as other tapers.
THE MACHINE TOOL WORKS, 24th and Wood Sts., Philadelphia, Pa.

March 22d, 1884.
Please send us by bearer one dozen each, three-cornered, as per samples, &c. The sample sent us for trial has given entire satisfaction, and we are well pleased.
THE J. M. BRUNSWICK & BALKE CO., New York.

February 1st, 1884.
The Files are the best; will file twice as many saws as other tapers.
HERRESHOFF MFG. CO., Bristol, R. I.

Trade Report.

Philadelphia.

Office of The Iron Age, 220 South Fourth St.,
Philadelphia, September 23, 1884.

Pig Iron.—The past week has not confirmed the hopes of improvement which were expressed some days ago, although it cannot be said that prices are any lower. On the contrary, the market has been fairly steady, but there is less activity and less inquiry, with some indication that for the present the requirements of consumers have been pretty well satisfied. In any case, there seems to be something of a falling off in the demand, and, while the supply of good Irons is by no means large, sellers are showing renewed anxiety to secure business, so that it is quite evident that if prices are maintained there is no immediate prospect for anything beyond that. This is a severe disappointment to those who have been holding on from week to week in the hope of better prices, and will lead in some cases to a prompt curtailment in production. Heavy losses must have been made on large lots sold within the past six or eight weeks, and it is certain that business cannot be carried on in that way for any length of time. Hence the blowing out of furnaces here and there, while others who have been quoting low prices have withdrawn from the market entirely. Nominal prices for standard brands are \$19.50 @ \$20 for No. 1 Foundry and \$17 @ \$17.50 for Gray Forge, but very large quantities have been picked up at less money, so that it is a difficult matter to find a market at quoted rates. A limited amount of business can be done, of course (and the supply of good Iron is not large), but buyers respond very reluctantly, and those who can take 100-ton lots and upward seem to expect concessions every time. Foundry Irons are steadier than other descriptions, but there is no demand for large lots, so that increasing depression would quickly follow a few days of dullness. In special cases quotations of \$19 have been made, but \$19.50 @ \$20 for No. 1 Foundry are the usual rates for tide-water deliveries, and from that to \$21 for a few choice brands. Mill Irons are more irregular, owing to the difference in quality, and sometimes because of the large lots that are taken in a line. Ordinarily \$17 @ \$17.50 is quoted for standard brands, but good Irons are said to have been bought at \$16.50, and others with more or less cinder mixture at \$15.50 @ \$16. Nevertheless, there is reason to believe that there is less opportunity for securing low-priced Irons than there was some time ago, and, while the general market is extremely dull, it is not unlikely that the average prices realized on current transactions are something better than on those during the earlier portion of the month.

Foreign Iron.—There is very little doing, and prices are almost nominal at \$19 @ \$19.50 for shipments of Bessemer and \$20.50 @ \$21 for special brands. Spiegeleisen sold at \$26.50 for 20 % and \$22.50 for 10 to 12 %, in 1000-ton lots, with further inquiry for 1000-ton lots of 30 %, which seems likely to result in business.

Muck Bars.—There is no special change, the demand being chiefly for small lots, at prices varying from \$29 to \$29.50, according to quality and location of mill.

Blooms.—Demand very slow and prices irregular at the following figures asked: Charcoal Blooms at \$52 @ \$53; Run-out Anthracite, \$43; Scrap Blooms, \$40; Northern Ore Blooms, \$38.

Bar Iron.—The market remains in an exceedingly depressed condition, and the demand is for the smallest kind of lots. Manufacturers begin to lose all hopes of improvement this season, and are settling down to what may almost be termed a retail business. There is no demand whatever for lots of any size, so that there are no orders to work on except such as come in from day to day. These may be continued or may not, but the uncertainty is very discouraging. Prices are more or less nominal, with 1.85¢ @ 1.9¢ quoted on Best Refined Iron, and 1.65¢ @ 1.75¢ for Common and Medium.

Plate and Tank Iron.—The same remarks apply to this department as to the Bar trade. A few good-sized lots are taken once in a while, and the mills have been able to keep two or three weeks' work before them during the greater portion of the year, but it is harder to do so now than at any time during the past six months. They are, with but few exceptions, running close to the end of their orders, so that there is increasing anxiety for business, and, as usual in such cases, a good deal of demoralization in prices. Nominal quotations are as before, but on large lots more or less shading is done, the asking rates being as follows: Plate Iron, 2.1¢; Tank, 2.15¢ @ 2.25¢; Shell, 2.75¢; Flange, 3.75¢; Fire-Box, 4.25¢.

Structural Iron.—The market is exceedingly quiet, no new orders having been on the market for some time past, except for trifling quantities. Some of the mills have work enough to run them all next month, but in the majority of cases a week or 10 days would enable them to finish everything close up. The feeling is anything but cheerful, as there is nothing in sight likely to improve things in the near future. Meanwhile the market is unsettled and weak at the following prices asked: 2.1¢ for Angles, 2.25¢

for Bridge Plate, 2.75¢ for T's and 3.5¢ for Beams and Channels, subject to the usual discount on large lots.

Sheet Iron.—A fair demand is reported, and at somewhat more uniform prices than before. The best makes are steadily held at quoted rates, but there is more or less shading on inferior quantities, which appear to be in large supply. Prices for standard qualities are about as before, viz.:

Best Refined, Nos. 26, 27 and 28.....	4 ¢
Best Refined, Nos. 18 to 25.....	3 1/2 ¢
Common, 14¢ less than the above.....	
Best Bloom Sheets, Nos. 26 to 28.....	6 1/2 ¢
Best Bloom Sheets, Nos. 22 to 25.....	6 ¢
Best Bloom Sheets, Nos. 16 to 21.....	5 1/2 ¢
Common Red Plates, 2-16 to 18.....	3 1/2 ¢
Blue Annealed.....	2 1/2 ¢
Best Bloom, Galvanized, discount.....	50 ¢
Second quality, discount.....	32 1/2 ¢
Common, discount.....	57 1/2 ¢

Wrought-Iron Pipe.—There is very little change in this branch. The demand is light and prices remain in the same demoralized condition noted last week. It is impossible to name definite figures, but the range of prices is lower. Buyers take small lots only for immediate requirements, and expect to do better each time they enter the market. Under these circumstances any quotation would be uncertain and unreliable.

Steel Rails.—There is a pretty good inquiry, notwithstanding the recent heavy transactions, and several large orders are still under negotiation. Prices are firm, but not higher, \$27 @ \$27.50 at mill being the usual quotations, according to quantity, time of delivery, &c. A fair amount of business has been entered during the week, and, on the whole, the position has been fully maintained, if not slightly improved.

Steel Blooms.—There is a fair demand for small lots of Foreign at \$36.50 @ \$37.50 at tide, according to analysis. Domestic Slabs, \$37 @ \$38, delivered.

Crops Ends.—There is no inquiry at present, although bids of \$20.50 are solicited for 1000-ton lots of West of England makes.

Old Rails.—The market is feverish and irregular, with a considerable disparity in the views of buyers and sellers. At interior points lots along the line of road are taken at from \$18 to \$18.50, but for seaboard lots buyers are not inclined to bid over \$17.50 for T's and \$20.50 for Bridge Rails, with sellers at about \$1 more.

Scrap Iron.—Continues fairly active, but no large lots are moving. Best quality Domestic No. 1 is held at from \$19.50 to \$20.50; less desirable lots at varying prices, according to selection, &c. Foreign, in cargo lots, at \$18.50 @ \$19; Wrought Turnings, \$15 @ \$16; Machinery Scrap, \$15 @ \$16, and Cast Turnings, \$10 @ \$11.

Nails.—There is a fair demand for small lots, principally from jobbers and retailers whose stocks are light and in constant need of replenishment. No large lots are selling, and prices show no change; \$2.10 @ \$2.20 is the general price, with a majority of sales at the lower figure. Carload lots of Steel Nails are offered at \$2.20, and are moving more freely, but in small lots.

Pittsburgh.

Office of The Iron Age, 77 Fourth Avenue,
Pittsburgh, Pa., September 23, 1884.

There has been very little change in the general Iron situation during the past week; dullness still prevails. Orders continue to come forward very sparingly, and, what is still worse, prices are irregular and unremunerative. The volume of business is exceedingly light for the season; a large proportion both of the furnace and mill capacity is unemployed, the effect of which is felt seriously in other branches of trade, including Coke, Coal, Limestone, &c., and, as a natural consequence, there is a great deal of unemployed labor. The indications at present point to a hard winter in the mill and mining districts. The increasing number of natural-gas companies leads to the belief that there will be a sharp competition before long, and, if so, that the cost of the article will be materially reduced. Already we hear that some of these companies are offering to supply large consumers, like rolling mills and blast furnaces, at a price below that of Coal, no matter what that may be. It is claimed that the price of natural gas could be reduced considerably and still afford a good margin for profit. Considerable apprehension is entertained in some quarters that the gas wells will not hold out, but there is no good reason for apprehension. The wells at Leechburg have been in full blast for years and are still flowing as steadily as ever. There is reason to believe that within the next year or so nearly all our manufacturers will be using the gas in question for fuel at Pittsburgh.

Iron Ore.—There is no improvement in the market, nor is there likely to be for some time to come; consumption continues to fall off, as the number of idle furnaces is steadily being increased, and the outlook is exceedingly discouraging. Stocks at Lake ports, Cleveland in particular, are large and increasing.

Pig Iron.—There has been no improvement the past week, and the prospect continues just about as discouraging as ever. But a small portion of the puddling capacity is employed, most of the furnaces being worked single time, and some are standing idle. However, there is but little pressure to sell; producers generally are just about as indifferent in regard to selling as consumers are about buying. Now and again a furnaceman will be found whose necessities compel him to sell at the best price obtainable.

for Bridge Plate, 2.75¢ for T's and 3.5¢ for Beams and Channels, subject to the usual discount on large lots. The supply in the hands of consumers is light, and the same is true of many of the furnaces, yet it is very evident to those who are at all familiar with the trade that the supply is considerably in excess of present wants. A number of the banks and insurance companies here hold a good deal, having had to take it in order to secure themselves, and this, or at least a large portion, will be placed on the market whenever there is a chance to sell, and until the stock thus held is disposed of there will not be much improvement. Prices are substantially as noted a week ago, viz.:

Neutral Mill.....	\$16.00 @ \$16.50, 4 mos.
All-Ore Mill.....	17.00 @ 18.00, 4 "
White and Notched.....	15.00 @ 15.50, 4 "
Silver Iron.....	17.50 @ 18.50, 4 "
No. 1 Foundry.....	19.00 @ 20.00, 4 "
No. 2 Foundry.....	17.00 @ 18.00, 4 "
Cold-Blast, Charcoal.....	25.00 @ 28.00, 4 "
Warm-Blast Charcoal.....	22.00 @ 24.00, 4 "
Bessemer Iron.....	18.50 @ 19.00, 4 "

Muck Bar.—There have been no sales reported recently, in the absence of which we continue to quote at \$29 @ \$30, cash; good makes can be bought at \$29, cash, and possibly for less.

Manufactured Iron.—Manufacturers generally continue to report the situation unchanged; orders are few and far between, while prices are irregular and unsatisfactory. Prices are still quoted on a basis of 1.65¢ @ 1.75¢ for Bars—that is, for first-class stock; No. 24 Sheet, 2.85¢ @ 2.9¢; Plate, 2.25¢ @ 2.3¢, 60 days; Skelp Iron is still quoted at 1.75¢ @ 1.85¢. Mill owners claim that it costs more to make Skelp than Bars, yet orders for the former are generally for good-sized lots, from 100 to 500 tons, whereas orders for Bars are mostly small and a good deal mixed. But very few of the mills are working full; some of them are idle.

Nails.—There has been no improvement in demand during the past week; orders generally are small, and it is evident that neither jobbers nor consumers will care to anticipate future wants until more fully assured that hard pan has been reached. It is claimed by those who are in a position to know that the market is in a worse condition now than for several years; that, while prices are not yet quite so low, the cost of production is greater. Some manufacturers still quote at \$2.10, 60 days, 2 % off for cash, in car lots, but it is admitted that others are taking orders at \$2, same terms.

Wrought-Iron Pipe.—There is a fair degree of activity; some of the Pipe mills are running full, but prices are unsatisfactory, the result of an active competition. Prices remain as last quoted. Discount on Black Butt-Welded Pipe, 40 %; on Galvanized do., 30 %; on Black Lap-Welded Pipe, 60 %; Galvanized do., 45 %; discounts on Boiler Tubes, all the way from 52 1/2 to 60 %, according to size and character of order; 2-inch Oil-Well Tubing, 12¢ @ 13¢ foot, net; 5 1/2-inch casing, 40¢ @ 45¢ foot, net. Some of the Pipe manufacturers have resumed the list in use prior to the one prepared by the combination; the combination list, it appears, was very unsatisfactory to many jobbers, and possibly had considerable to do with the collapse of the combination.

Steel.—There is a fair degree of activity, but prices are irregular and unsatisfactory, particularly as regards the lower grades. It is evident, however, that Steel is gradually, but steadily, taking the place of Iron. The latest feature is the Steel Nail, which promises to be the Nail of the future. Best brands Refined Cast Steel, 9 1/4¢ @ 10¢; do. Crucible Machinery, 5¢ @ 5 1/2¢; Open-Hearth and Bessemer do., 2 1/4¢ @ 3¢. Steel Slabs for making Steel Nails are coming up, and promise to be quite a feature in the trade. Steel has almost wholly supplanted Iron for Boiler Plate.

Steel Rails.—A firmer feeling appears to obtain, and the opinion gains ground that the lowest price has certainly been reached. We continue to quote, in the absence of sales, at \$27 @ \$28, cash, at mill, according to character of order, delivery, &c.

Old Iron Rails.—Continue very dull and with a light demand and considerable of a pressure to sell. Prices are weak. We can report a sale of 500 tons at \$19.50, and more are offered at the same figure.

Railway Track Supplies.—Continue exceedingly dull, with but little prospect of improvement this side of next spring. Prices are nominally unchanged. The combination price for Spikes is 2.35¢, 30 days, but they can be bought for considerably less. Splice Bars, 1.65¢ @ 1.75¢; Track Bolts, 2 1/4¢ @ 2 1/2¢.

Crop Ends.—American are still quoted at \$18 @ \$18.25. The last sale of Foreign reported was at \$23.50, delivered in Pittsburgh.

Scrap.—No. 1 Wrought Scrap is still quoted at \$18 @ \$19 @ net ton, the outside figure for Selected; Wrought Turnings, \$14 @ \$15; Old Car Axles, \$25 @ \$27; Cast Borings, \$12 @ \$12.50, gross; Old Car Wheels, \$16.50 @ \$17, gross ton.

Window Glass.—Trade continues quiet for the season, while prices remain unchanged; Single Strength, in car lots, 60 and 20 %; Double Strength, 70 and 10 %.

Coke.—Some of the Eastern Pennsylvania furnace owners are insisting on lower prices, but producers say that rather than make any further concession they will blow out all their ovens. The syndicate price for blast-furnace Coke remains unchanged at \$1.10 @ ton, delivered free on cars at ovens. Manufacturers say there is no profit at present prices.

Chicago.

Office of The Iron Age, 36 and 38 Clark St.,
Cor. Lake St., Chicago, September 23, 1884.

Hardware.—The position of the Hardware market is very much the same as a week ago. Business has reached the point where jobbers are pressed to keep pace with their orders. Buying is kept within the limit of present consumption, and there is every reason to believe that the demand for goods so far is a fair criterion of the next two or three months' trade. In appearance there has been less business in some of the jobbing houses compared with a week ago, because the number of callers has very much diminished. Orders, however, from their traveling men have been proportionately increased. There is one feature which will largely control business yet to come. It is the prices which farmers will be able to obtain for their crops. There has been an abundant harvest, it is true, but prices for all kinds of grain are exceedingly low, and there are many among the agricultural class who are unwilling to sell at prevailing figures more than what will be actually necessary to sustain their families. Unless they can get a fair price for their product the amount of money they will have to invest in improvements will be limited, and thus affect the volume of business accordingly. The market for General Hardware is reported steady, and no material change in prices except for Tin Plate and Zinc goods, which are weaker.

Barb Wire.—The market does not present anything new or of much importance. Trade is pretty good—in fact, much better than a month ago—but not what might be expected when the price at which Wire is selling is considered. Some buying for storage is reported, though the majority of sales are made for consumption. Barb Wire at present figures is considered a good stock to carry, but there are few men who have the courage to back their opinion in more than carload lots. For lots of this size 4 1/4¢ is quoted for Galvanized, and 5 1/4¢ for Painted. Inside information says that these figures can be discounted, but to what extent cannot be learned.

Nails.—The Nail market is weak and uncertain. The past week opened with Nails pretty steady at \$2.20 carload lots, but before it was half through that price was made in a small jobbing way, and carload lots had dropped to \$2.15, 2 %, 60 days, and are now quoted weak at that figure by some of the dealers, while others assert that they have not sold Nails for less than \$2.20 in car lots. While Pittsburgh and Wheeling makers are contending for \$2 at mill, parties outside of their domain have sold between 5000 and 6000 kegs at \$2, 2 %, 60 days, delivered in Chicago. The dismay brought about by these "deals" can be easily understood, and any attempt to bolster up prices against such slashing is an utterly hopeless task. The Steel-Nail men are working still further consternation in the market by selling their Nails in small lots of 5 to 10 kegs at the same figures that Iron Nails are selling for, and shipping them to every cross-road store in the country. They say this is "to introduce the Nail," and when the Nail is introduced there is little doubt that the battle between Iron and Steel will be the merit of the article, and not the price.

American Pig Iron.—The market during the week has been fairly active and strong. During the week one concern placed 1000 tons No. 1 Lake Superior Charcoal in storage in this city, with instructions to hold the Iron until \$23, cash, could be realized on it. Several other furnaces in the district that could be named are asking \$21, cash, which has been accepted heretofore on four months' time. These same furnaces, with many others who make Coke Iron, are unwilling to take contracts of any kind which extend beyond January 1st next. Through the blowing out of the Citoico Furnace, last week, there is withdrawn about 100 tons a day of Southern Iron, which was principally marketed here. The curtailment in production among Southern furnaces is having a good effect upon the market, and prices are more regular and demand better than it was several weeks ago. Nearly all of the large manufacturers who contract at this season have made their arrangements, and trade consists largely of the 200 to 300 ton buyers and carload orders. Of these there are quite enough to absorb all the surplus stock not taken up on contract from furnaces in the market. At present writing supply is perhaps a trifle less than demand on L. S. C. Irons, not counting those furnaces who are piling up their Iron to wait for higher figures. A number of odd lots that were on the market some time ago have been cleared out, and it now looks as though everything to be had must come from legitimate sources. We quote as follows for carload lots, four months, except Southern No. 2, which is cash: Lake Superior Charcoal, Nos. 1, 2 and 3, at \$21 @ \$21.50; Nos. 4, 5 and 6 at \$22; Lake Superior Coke at \$20; Lake Superior and Ohio, mixed, at \$20 @ \$21; Ohio Standard Black Band, No. 1, at \$21; Southern, No. 1, at \$18; No. 2 at \$17; Silvery Soft at \$17.50 @ \$19.50; Anthracite, No. 1, at \$21, and No. 2 at \$20; Briar Hill Bessemer Pig, \$21.50.

Scotch Iron.—The market for imported Iron is steady, and demand somewhat less than a week ago. More of this Iron has been sold to implement makers this season than last, but with the cessation of that demand business has been on the decline. There is no change in prices, which are

quoted as follows: Summerlee, \$25.50, cash, from yard, and \$24.50 to arrive; Glengarnock, \$25.50 from yard, and \$24 to arrive.

Merchant Steel.—The Steel market is very unsatisfactory. A great deal of underhand work on the part of makers is reported, and some startling cuts will probably be brought to light before another week ends. Rumor has it that one mill has disposed of all its product for a time at prices much less than any that have heretofore been made. Tool Steels are sold from store at 8 1/2¢ as an open price on some brands, but the better class is not included, they say. Where the line is drawn it is hard to determine. For Refined grades from store we make the following quotations:

	Per pound.
Best Refined Cast Tool Steel.....	8 @ 10¢
Crucible Cast Machinery Steel.....	8 @ 8 1/2¢
Open-Hearth and Bessemer Steel.....	8 @ 8 1/2¢
Open-Hearth Spring Steel.....	8 1/4 @ 8 1/2¢
Tool-Calk Steel.....	8 1/4 @ 8 1/2¢
Fire-Box and Boiler Steel.....	8 @ 8 1/2¢
Syndicate Steel.....	7 @ 7 1/2¢

Steel Rails.—There is very little demand for Steel Rails for present delivery. There have been several 2000 or 3000 ton sales made during the week, but credited on previous contracts, which are said to be at a less price than mills are now asking. For such inquiries as are on the market they are asking \$30, cash, at mill. The Chicago branch of the North Chicago Rolling Mill Company have shut down, and several other makers are reported short of work, but not anxious to accept orders at prevailing figures.

Old Rails.—We learn of sales of about 5000 tons at \$18.50, which is a fair quotation for small lots. Buyers do not care to carry a large stock, and where a block of 10,000 to 20,000 tons is offered, \$17.50 would be top price. The market is a shade better on small lots, but no change for heavy transactions in favor of sellers.

Structural Iron.—The market for Structural Iron has been tolerably fair for store stock, and several of the mills report sales of specials to be delivered during next month. Most of the makers express themselves as having had a fair summer's business, but less than was expected at the outset. We continue following quotations, with 1/4¢ @ 1/2¢ added for delivery from stock: Beams, \$3.60; Channels, \$3.60; T Iron, \$3.3; Angle Iron, \$2.50; Flitch Plates, \$2.50; Frieze Plates, \$2.70.

Bar Iron.—The market is reported without change for the week. A fairly active demand continues, but in smaller quantities than for several weeks past. Most of the heavy buying has been done. Best Refined New Puddled Iron is quoted at \$1.85 @ \$1.90 from store. Demand for Common Iron was very fair, and one concern is said to have sold a large lot at \$1.50, mill rates, which is about 5¢ less than anything previously reported. There is a wide range in prices, and mills are sometimes compelled to accept the best price that can be had. From store \$1.70 @ \$1.80 is quoted.

Norway Bars.—Market steady, and demand, if anything, a trifle better than the week previous. The price quoted to Merchant trade is \$3.75, and to consumers, 4¢ rates.

Galvanized Iron.—There is nothing of importance in Galvanized Iron for the week. Jobbers report a good trade for the season, stocks in fair condition and prices without change, as follows: Juniata, 52 1/2 % off; Charcoal, 55 % off, and Refined, 57 1/2 % off.

Black Sheets.—The local market in Black Sheets for consumption is fairly good in small lots, which can be had from jobbers at prices that discount those offered to larger buyers. Mills are having a brisk trade from Stove-pipe and Elbow makers; the jobbing trade in different parts of the country are also placing orders for good-sized stocks. The stock in the hands of our jobbers is light, and some misgivings are manifested as to what October stock will cost them. Mills are not inclined to make concessions, and, if prices asked must be paid for more stock in addition to what they have taken, the business promises a poor investment. It is said that mills have offered to deliver Sheets to jobbers in Chicago at \$2.90 for No. 27, but even these figures were not acceptable. We make the following quotations as a retail price asked, though we know that Sheets can be bought for less in small lots: Nos. 10 to 14 at \$2.60 @ \$2.70; No. 24 at \$3; Nos. 25 and 26 at \$3.10 and No. 27 at \$3.20.

Old Wheels.—The market is sluggish, and no transactions are brought to notice. Foundries are quoting \$17, but those who have the stock will not accept the price at this time.

Scrap Iron.—The demand for Scrap has been very quiet during the week. The market is weak, and any effort to force stock would be the means of reducing the price. Mills quote \$15.50 @ \$17 for No. 1, and \$11 @ \$12 for No. 2, Chicago or Milwaukee delivery. We make the following quotations as dealers' purchasing prices: No. 1 Wrought Scrap, 1/2 net ton, \$15; Cast Scrap, 1/2 net ton, \$12; No. 1 Stove-Plate Scrap, 1/2 net ton, \$8; Wrought Turnings, 1/2 ton, \$8; Cast-Iron Borings, \$6; Old Plow Steel, \$9; Tool Steel, 1/2 ton, \$15; Locomotive Steel Tire, 1/2 net ton, \$13; Buggy Springs, 1/2 net ton, \$14.50; Malleable Scrap, \$5.

EVERETT & POST, 156 Lake street, Chicago, report to us as follows, under date of September 20, 1884: *Pig Lead.*—The only noticeable change in the position of Pig Lead

Trade Report.

General Hardware.

Trade continues rather quiet, the demand being acknowledged to be considerably less than is usual at this season. The goods that are moving are mostly in lots comparatively small. Prices have not materially changed since our last report, but careful buyers can often get concessions on regular quotations. The general report is that collections are fair, and, considering the condition of trade, as good as could be expected. The conservative course of manufacturers in avoiding an overproduction of goods, and the caution with which the Hardware trade purchase, are to be regarded as healthful features in the market at this time.

NAILS.

A good, active trade is in progress, and inquiries indicate its continuance. A fair proportion of large lots is being sold, and if sellers were disposed to meet the views of buyers as to prices they could augment their business considerably. It is remarked that the number of brands most favored in this market is growing smaller, some of the factories having shut down and others refusing to meet the lowest prices now current. One of the latest factories to discontinue production is that at Wareham, Mass., operated by the Bridgewater Iron Company. Unremunerative business is the cause of their shutting down. Other factories are expected to follow their example if prices do not improve. Restriction of production is the only cure for the condition in which the Nail market has been thrust by the ill-advised efforts of some companies to realize on their surplus product. Sales are occasionally made by these manufacturers for delivery on dock in carload lots at prices considerably under these quoted for regular store lots. It is explained that this is inevitable, as sales thus made are out of the regular channels of business, and buyers are obliged to assume the risk of getting some sizes which they do not immediately need and may have to retain on hand for several months before they can be disposed of. Hence, sales thus made are regarded as exceptional. Those buyers who purchase from New York stores pay from \$2.15 to \$2.25, according to quantity and brand, occasional sales being made at concessions for large quantities.

BARB WIRE.

Business is represented as somewhat quieter than it has been, though local establishments report themselves still fairly supplied with orders. Prices are very unsatisfactory, having reached a point yielding no profit to the manufacturer, though they are no lower than has recently been stated. The demand must be better in some other sections, however, as we hear of concerns resuming work which have been idle for a long time, and in many cases they resume with increased facilities for turning out wire. No improvement in prices is anticipated at present, and in the opinion of those interested it will not come until the prices of Rods and Plain Wire harden. Quotations are still reported on a basis of 5 1/4 to 5 3/4 cents for Galvanized Four-Point, according to quantity, Painted being 1 cent per pound cheaper.

RAILROAD SPIKES.

The combination among manufacturers of these goods is understood to be unable to hold up prices any longer, owing to the competition of a few outside concerns, and the condition of affairs now seems to be "every one for himself." We hear of offers as low as \$2.10 for large lots for delivery at points in this vicinity. Lower prices than this have been made for delivery at Western points.

THE CUTTING OF PRICES.

On reviewing the correspondence which has appeared in these columns, there are several facts which are brought very clearly to light. One, which is established on the testimony of manufacturers, jobbers and retailers, is that we have understated rather than overstated the extent to which the practice is carried and the mischief which it makes in prices and trade generally. The communications which have come to us from houses in all parts of the country and from manufacturers occupying the very highest position in the trade, whose goods and names are known by all our readers, afford the best evidence not only that this is a mischievous element in the present condition of the Hardware trade, but that it is a growing evil which has recently been carried to much greater lengths than in the experience of the trade in former years. There seems also to be substantial uniformity of opinion upon this point, that it is well to discuss this matter, ascertain the real facts of the case, and by letting light in on the evil prepare the way for its mitigation or removal. It is gratifying to observe that the most experienced and influential manufacturers unite in expressing their hearty sympathy with the efforts we are making in this direction.

As this subject has been regarded from many different standpoints, it is natural that our correspondents should suggest different causes which in their judgment have been instrumental in bringing about the present condition of things, and that they should suggest different remedies which would be more or less likely to correct the evil to a

greater or less extent. Looking over the letters which have appeared in our columns we find that the following causes are mentioned by our different correspondents as the principal ones tending to produce this state of things and induce the cutting of prices, of which so much complaint is made:

1. The prevailing custom which is to a large extent peculiar to the Hardware trade of giving a long series of discounts, beginning, as one correspondent has expressed it, at 50 or 60 per cent. and running down to 1 per cent.
2. The desire of the jobber for too much profit, several of our subscribers suggesting that the jobber should be satisfied with 10 per cent., another naming 5 or 10 per cent.
3. The fact that the jobber pays little regard to the quality of the goods, a low discount, except in the case of goods of established reputation which his trade demands, generally getting his order.
4. The method now almost universally adopted of selling goods through traveling salesmen, who are necessarily given a broad discretion, and who desire to sell goods at low figures if the orders cannot be secured at the regular prices.
5. The prevailing inactivity in business, and overproduction of goods.
6. The obligations under which manufacturers seem to consider themselves laid to meet all competition.
7. The credulity of travelers who believe, or affect to believe, whatever they hear with reference to low prices offered on competing goods, and the readiness with which they in many cases meet quotations that never were made.
8. The broad margins that are given by the manufacturers to the jobbers, enabling them to undersell the manufacturers' regular rates and still make a fair profit.
9. The cutting of prices by the manufacturers themselves, which induces the jobber to do likewise.
10. The practice of giving a special discount to a few of the large jobbing houses, who, it is alleged, do not, and will not, keep it.
11. The giving of quantity discounts, which put a premium upon larger orders than are required for the purchaser's legitimate trade, inducing him to unload at special figures below the manufacturers'.

It may be interesting also to notice some of the remedies which are suggested by our correspondents:

1. That the present condition of things be permitted to continue without interruption until it runs its course, the weaker manufacturers dropping out, jobbers being superseded, and manufacturers learning to do business on business principles.
2. That manufacturers stop giving jobbers special discounts, especially the extra 10 to 20 to the big jobbers.
3. That the jobber make himself useful to the manufacturer as well as the retailer, instead of demoralizing the manufacturers' prices, as he too often does.
4. That the jobber be controlled as to the prices at which he sells goods, and that goods be not sold to parties who break the prices.
5. That there be a union among manufacturers to thus restrain the jobber, determining the price at which goods shall be sold to him, and at which he shall be at liberty to sell.
6. That a Hardware Exchange be established in each large city, governed by the manufacturers, where their goods could be represented and sold.
7. That a rebate at the end of the season be given to jobbers who have sold the goods without cutting prices.
8. That *The Iron Age* publish the bottom prices on goods, as the jobber, it is suggested, seems bent on suicide, any way.
9. That manufacturers, instead of having a sliding scale on prices, sell all purchasers at substantially the same figure, having one price for retailers and jobbers.
10. That the jobbing system be discouraged and as soon as possible abolished.
11. That manufacturers visit the retailers, and, if necessary, the consumers, and sell their goods direct, as in some lines they are beginning to do.

But passing now to the subject as seen from another side, we have the pleasure of informing our readers that we have received from Hardware merchants throughout the country a number of communications on the cutting of prices, a subject in which they seem to take as much interest as the manufacturers. They all agree in representing the cutting as extensive, and, like our other correspondents, fail to suggest any remedy. Viewed from their standpoint they are not disposed to complain much of this slaughtering of prices, which is for their immediate and direct benefit, and yet several of them have written to us in expressing the view that the demoralization of prices which results from the practice is in the long run detrimental to the trade and against their interests. The letter which we print below from a merchant in Indiana refers to this point, and gives an illustration of the manner in which prices are demoralized:

I have read with much interest the articles on the cutting of prices. The retailer is not the one to wish for any cessation in cutting, looking at the matter from the point that it is to our interest to get goods at the lowest possible price. Looking at it in another way, a retailer expects each traveling man to quote a lower price than the preceding one on the same line of goods. We have lost confidence in the market. I

prefer dealing with the jobbers rather than with the manufacturers, as their prices are generally better, and I can sort up on different lines of goods. The quantity of any one line of goods on one order (unless season goods) hardly justifies a shipment nowadays. We try and keep as few goods as necessary. I can mention one instance of jobbers cutting under manufacturers. I wrote to the Manufacturing Company for quotations on —; also to Chicago and Cleveland. The manufacturing company quoted discount 25 per cent.; — (naming a well-known Chicago house), discount 30 per cent.; — (naming a Cleveland house), discount 35 per cent. I buy goods often from jobbers in special lines, prices guaranteed against the manufacturers. General opinion among traveling men seems to be that there will be no advance in prices until July, 1885. So under existing circumstances the cutting is likely to go on.

Our esteemed correspondent, whose letter is given above, is not the only one who referred to the demoralization of prices and the feeling of uncertainty which the average retailer suffers as to whether or not he has purchased his goods at the best figures to which he is entitled. This point is brought out clearly in the remark of an Ohio Hardware house, who write to us that from their standpoint they think prices are cut to even a worse extent than represented, so that they are not sure at any time that they have reached bottom, and add that this bottom is always found somewhere in the hands of the jobbers, rarely or never with the manufacturers, except in the Nail and Iron trade. The extent to which the manufacturers' prices are broken by the jobbers is shown in this remark: "As the trade stands now there is no object whatever in giving small orders to manufacturers, as we can invariably reach an extra through jobbers." They then refer to some lines of goods which in their experience they have found thus broken in price, mentioning, among others, all combination goods, adding significantly that, no matter how long and how strong the combination or the agreements, the first man out on the road for the jobbers will take the orders in some shape, if he has to pay the difference out of his pocket and charge it to road expense. The letter closes with this remark: "The present state of trade now seems to be for the retailer's benefit, but we feel that it is not, and that it is extremely depressing and unhealthy. We see no remedy other than a better class of traveling men, with a higher standard of business honor, or a sworn statement of every man on the road as to the direct or indirect sales on combination goods."

The letter which we give below mentions as a potent cause which is at the basis of the cutting of prices the fact that the jobbers are given such wide margins in the shape of heavy discounts. If this view is correct manufacturers will see that they must take to themselves a share of the blame if the jobbing trade break their prices:

To the Editor of *The Iron Age*: Having read your correspondence giving the various complaints of manufacturers, jobbers and retail dealers, I conclude that all have cause for complaint, growing out of the large special discounts or low prices allowed some large dealers. The complaints of each seem to be well-grounded, but I think the practice more pernicious to the retail dealer than any other, especially where strong competition runs rife; for instance, a runner that is disposed to make all he can for his employers succeeds in selling us goods at combination prices; presently other parties come in to find that our store is well supplied and not in want of any more of the goods; but the runner, wishing to sell goods to our competitors, in order to induce them to buy offers certain lines of goods at 10 per cent. lower prices, or more. Now, retail country dealers cannot compete with such opposition. Ten per cent. is too much difference in merchants buying goods. I think the practice of large special discounts should be done away with entirely or very much reduced.

The following blunt and forcible statement of the case is from a merchant in Texas, and presents some considerations which are worthy the attention of all interested in the matter:

To the Editor of *The Iron Age*: The discussion of the question in regard to cutting prices seems to be interesting to the Hardware trade throughout the country. I am a small jobber. My trade is solicited by manufacturers as well as large jobbers. Time and again have manufacturers assured me that I was getting their very best discounts, and no large jobber could buy lower, but the large jobber would knock these very best discounts sky high. I never investigate whether the manufacturer acts in bad faith, or whether the jobber sacrifices his legitimate profit. The question with me is: "Where can I get the best goods demanded by my line of trade at the lowest price?" With cash in hand I never experience any difficulty in getting satisfactory prices. All the remedies suggested so far in your valuable paper are worthless. The whole thing is regulated by the laws of supply and demand. The cutting of prices will not cease as long as there is an oversupply of goods in the country. If a Nail mill has a warehouse full of Nails and no orders booked ahead, and you make an offer below the market price, your offer is very apt to be accepted. The manufacturer may have sold fifty times the quantity last week to a large jobber at a higher price; he does not lose a moment's sleep over the injury he inflicts on him. On the other hand, if a large jobber gets a special discount and pledges his honor not to sell below a certain price, the very first thing he does, he makes that article a leader, without caring a fig for the injury he inflicts on the manufacturer. The reason why combinations are so short-lived is because self-interest is a stronger motive in human nature than honor. The present low prices have a tend-

ency to check themselves: 1. By stimulating consumption. 2. By forcing the weakest manufacturers out of the business. The entire army of middlemen, from the smallest retailer to the largest jobber, are powerless in regard to making prices. An advance in price can only be caused by the manufacturer in making less goods or the consumer in wanting more. A decline in price can only be caused by the manufacturer making more goods or the consumer wanting less. The middleman can no more control prices than the former can control wind and rain.

The following communication is brief and to the point, again referring to the large quantity discounts which it has been the policy of so many manufacturers to give to the jobbing trade:

I have read with interest your articles regarding "cutting of prices." I have been in business since 1857, and notice the trouble lies with the manufacturers themselves in giving larger houses a larger quantity discount, which is given away in the jobbers trying to supersede their neighbors in the same trade. Let them make one price on their goods and sell only to parties of good standing and known reliability, and there would soon be a change.

From a well-known house doing a jobbing as well as a retail business we have a letter in which they express themselves as thoroughly disgusted with the way goods are slaughtered, and they mention some leading goods, many of which are in combination, which are sold pretty regularly at a cut price. Several instances of this they confidentially name, showing the extent to which the practice is carried, and the demoralization in prices which results. But as indicating some of the prevailing methods, and giving a hint as to the way the thing is done, we give our readers an extract from their interesting communication:

Our observation has been that there is more cutting among the jobbers than the manufacturers. We think one of the causes is that the jobbers try to reach the extreme quantity to get the extreme prices. In many cases their legitimate trade will not justify them in buying the quantity, so they commence giving some of their "friends" part or all the rebate—in other words, "whack up" with them in order that they may secure the quantity rebate. These many "friends" are sometimes treacherous, and give it away to friends of theirs, who meet the price. Then the music begins, and in such transactions we think the fiddler pays the dancer instead of the dancer paying the fiddler. Shrewd business men are suspicious of houses who do the cutting business, and buy, as a rule, the "bait" only, while the good order goes to some reliable house. We think part of this difficulty might be overcome by manufacturers ascertaining to a certainty who are jobbers, and put such on an equal basis. This surely would do away with the "whack-up" business to reach the quantity. One thing is certain, and that is that merchants are, under existing circumstances, taking too much risk in the way of losses by bad accounts for the profit there is in the business. When they come to make up the final balance sheet for the year they wonder how they can sell so many goods and make so little money. We hope the question will continue to be agitated until some means can be devised by which all can make a fair margin. No doubt overproduction is the starting point in many cases for cutting. Merchants have the goods and must unload.

In the letter which we give below, which was crowded out from our last issue, the manufacturer finds some hope of the solution in the concerted action of manufacturers who will control their products and regulate their prices to the jobbers, and the prices at which the jobbers are at liberty to sell their goods:

To the Editor of *The Iron Age*: We are very much interested in the discussion, "cutting prices," and it looks as if an exchange of views between manufacturers and jobbers, ought to develop some plan by which the evil could be abated. We all understand how, for the last two years, there has been a constant shrinkage in the consumption of manufactured goods. Manufacturers, finding this trade growing less, would push their goods on the market correspondingly harder. Jobbers, experiencing the same troubles, would resort to the same energetic measures to avoid the same trouble. Results, lowering of prices by manufacturers to keep their works busy, and a wholesale slaughter of prices by jobbers to unload their goods before a further decline would leave them in the lurch with a stock of high-priced goods on hand. We don't believe the jobber is to be blamed for the part he has taken. We believe the trouble is principally with the manufacturer, and we can only see one way out of it. Manufacturers must by concert of action contract their product, that there will be no overproduction; next, they must agree among themselves upon prices to the jobbers. Then they must adopt some intelligent plan by which they will give the jobber a rebate at end of the season, provided the jobber does not sell the goods below the purchasing price. By this means cutting of prices can be stopped and manufacturers and jobbers realize a fair profit. Combinations and pools as too frequently conducted are odious, but if fairly and honestly organized and conducted they are a benefit to manufacturers, jobbers and consumers. We believe we have all got to come to it, and we would like very much to hear an expression of opinion. MANUFACTURER.

MANUFACTURING ENTERPRISE.

A reference to our department of Industrial Items from week to week will show that manufacturers are taking advantage of dull times and low prices to make improvements. The commercial depression affects manufacturing activity as regards production, but it does not check the spirit of enterprise which animates our manufacturers and people generally. Not only are more economical processes being introduced by those whose works are in active operation, but extensions are being made in prepara-

tion for an era of better business which must dawn before long, while entirely new enterprises are being undertaken by men who have faith in the developments of the future, and will be ready when the time comes to "seize occasion by the hand." Removals of works to better locations, it will be observed, are not infrequently mentioned. Only a few days ago a Connecticut hardware manufacturer remarked that for years he had been cramped for room in his old location, and had suffered great inconvenience from inadequate transportation facilities, but had always been too busy to take time to move to a better point. He is, therefore, not disposed to grumble at the present lull in business, which permits him to select an eligible site elsewhere, to construct his new shops after carefully matured designs, and to feel that when business revives he will be able to do more work and with greater comfort than ever before.

MISCELLANEOUS ITEMS.

The price of Rappley's Improved Saw Jointer, made by F. A. Rappley, Farmer Village, N. Y., and illustrated among the Hardware Novelties on page 31, is \$3 per dozen, subject to a discount of 50 and 4 per cent.

The Alford & Berkeley Company, 77 Chambers street, New York, are expecting very soon to receive sufficient of Allard's Patent Screw Drivers, for which they are agents, to fill the orders which have been waiting for the goods for some time, and also to enable them to carry some in stock for the further demands of the trade. We learn that this Screw Driver has recently been materially improved both in material and style of construction, gun-metal nuts having been substituted for the white metal ones, and wider grooves being made in the steel shank, thereby, it is claimed, giving more material to wear in the metal of which the nut is composed, thus rendering the tool more durable and consequently more desirable than formerly.

Harrison Brothers & Howsen, for whom W. C. Burkinshaw is sole agent at 126 Chambers street, New York, announce that they have received from Sheffield, a full line of Cutlery, which they will carry in stock, mentioning that they find the condition of business is such as to make it advisable to do so this year. The line they have in stock comprises Ivory, Pearl, Ivoride and Black Rubber Table Cutlery, Pocket Cutlery and Razors, and other goods suitable for the Holiday trade.

Henry Schade, 56 Ainslee street, Brooklyn, and 26 John street, New York, advises us that he is about to finish an exceptionally large order, consisting of 5000 sets of Hollowware, comprising Caster, Butter Dish, Fruit Stand, Napkin Rings, &c., 11 pieces.

We are in receipt from Morley Brothers, East Saginaw, Mich., of an interesting and attractive catalogue illustrating the Blue Line Lumbering Tools, which they offer to the trade. In their introduction they mention that these Tools are manufactured of the best materials, by practical mechanics, and that, situated as they are in the midst of the largest lumbering district in the United States, they are constantly in communication with the most experienced and extensive lumbermen and thus have the benefits of their practical advice. For the information of those who are interested in this line of goods we would say that this unique catalogue covers such Tools as the following: Ring Peavies, Socket Peavies, Cant Hooks, Cant and Peavey Hooks and Clamps, Loading Blocks, Swamp Hooks, Chain Hooks and Cold Shuts, Cant Hook and Peavey Handles, Hand Spikes, Pike Poles, Skidding Tongues, Boot Calks and Sets, Board and Log Rules, Log Calipers, Batting Dogs, &c. It also exhibits Benjamin's Lock Binder, a contrivance patented June 17, 1884, which is recommended as simple, effective and durable. W. Dodman, 107 Chambers street, New York, is agent for this line of goods, of which samples can be seen at his office.

The Higginum Manufacturing Corporation, Higginum, Conn., issue a small pamphlet illustrating implements for farmers' use, among which we note as new articles Clark's Improved Root Cutter and a new Right-Hand Sheller, the "R. V. C.," for which they make special claims.

On page 35 our readers will find the advertisement of the Taylor & Boggis Foundry Company, Cleveland, Ohio, in which they illustrate their Patent Self-Feeding Horse Trough. A. B. & B. W. Westervelt, 102 Chambers street, New York, and Chas. J. Field, 633 Market street, Philadelphia, are agents for the sale of this article.

AMERICAN MACHINE COMPANY.

The following is the price list of the Perfection Scale, manufactured by the American Machine Company, Philadelphia, and illustrated among the new goods on page 31. It is subject to a discount to the general trade of 15 per cent., with a further discount of 5 per cent. for cash in 30 days, or of 6 per cent. for cash in 10 days:

Druggist's Scales.	
No. 14, Brass Pan, 7 1/4 inches diameter; capacity 14 oz.—2 lbs.	\$8.00
No. 15, Brass Pan, Nickel-Plated, 7 1/4 inches diameter; capacity 14 oz.—2 lbs.	8.75
No. 24, Brass Pan, 9 1/4 inches diameter; capacity 14 oz.—5 lbs.	10.75
No. 25, Brass Pan, Nickel-Plated, 9 1/4 inches diameter; capacity 14 oz.—5 lbs.	11.75
Tea Scales.	
No. 10, Tin Scoop, 12 1/4 inches long; capacity 1/4 oz.—2 lbs.	\$6.50
No. 11, Brass Scoop, 12 1/4 inches long; capacity 1/4 oz.—2 lbs.	7.25
No. 12, Brass Scoop, Seamless, 12 1/4 inches long; capacity 1/4 oz.—2 lbs.	8.00
No. 13, Brass Scoop, Seamless, Nickel-Plated, 12 1/4 inches long; capacity 1/4 oz.—2 lbs.	8.75

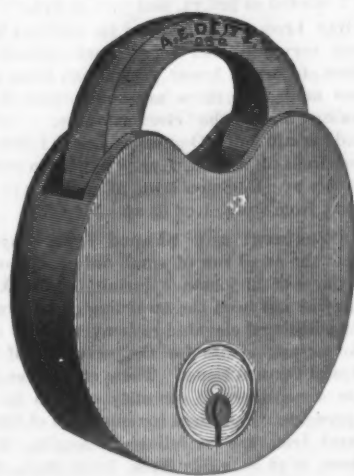
L. COES' Genuine and Mechanics' PATENT Screw Wrenches
MANUFACTURED BY
L. COES & CO.,
Worcester, Mass.
ESTABLISHED IN 1839.




Our Genuine Wrenches are made with straight bars, full width and enlarged jaw, having ribs cast inside, which strengthen the jaw and give a full bearing on front of bar. These improvements, in combination with our new ferrule, made with double bearings, an iron tube, fitted to the shank and resting against the lower bearings, rigidly held in position by the handle and nut, effectually preventing back thrust of ferrule (see sectional view), verify our claim that we manufacture the heaviest and strongest Wrench in the market. None genuine unless stamped.

L. COES & CO.,
Worcester, Mass.
Warehouse,
97 Chambers and 81 Reade Sts.
NEW YORK.
DURRIE & McCARTY,
Sole Agents.

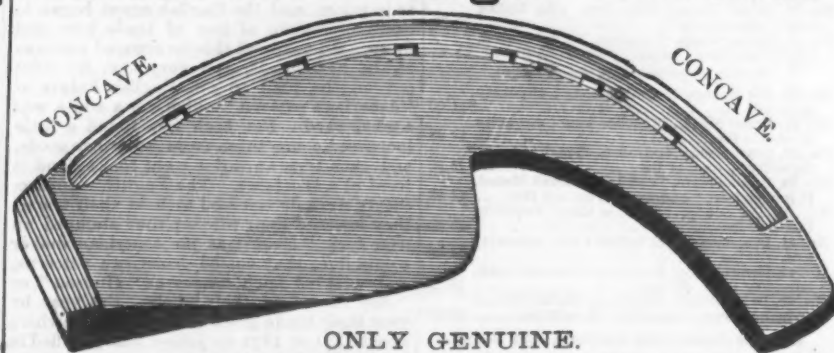
A. E. DEITZ. "Greenfield" Forged Ox Shoe.



DURRIE & McCARTY, Agents,
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CAST BRASS HARDWARE
FOR
ICE HOUSES AND REFRIGERATORS.
Manufactured and kept in stock by
W. & J. TIEBOUT,
Manufacturers of
BRASS, GALVANIZED & SHIP CHANDLERY HARDWARE,
Nos. 16 & 18 Chambers St.,
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ONLY GENUINE.

Made under the Parker and Colburn Patents, from Burden's H. B. and S. Iron. Nail holes punched, and every shoe perfect.
The Parker and Colburn Patents cover broadly the dies in which the shoes are forged. We are the only licensees, and all parties are cautioned against using either of the forging mechanism or processes so protected, as our rights under said patents will be fully maintained.
While we can furnish either the Concave Shoe with One Calk, or the Flat Shoe with Two Calks, we emphatically recommend the Concave, with one Calk, for the following reasons, viz.:
First.—Because the entire bearing of the shoe should come upon the shell of the hoof, and not upon the ball or tender part of the foot, as is necessarily the case with the flat shoe. This principle is recognized by all experts in the shoeing both of oxen and horses, and will prevent a tendency to sore-footedness.
Second.—Because by having one calk only, the shoe can be cut off or lengthened and fitted more perfectly to the foot.
Third.—Because by having one calk only, the shoe can make the other calk at any angle he desires.

No. 1, Full Length, Concave, 5 inches, Weight, per Set of Eight Shoes, 3 1/2 pounds.
" 2, " " " 6 " " " " 3 1/2 " "
" 3, " " " 6 1/2 " " " " 4 " "
" 4, " " " 6 3/4 " " " " 4 1/2 " "

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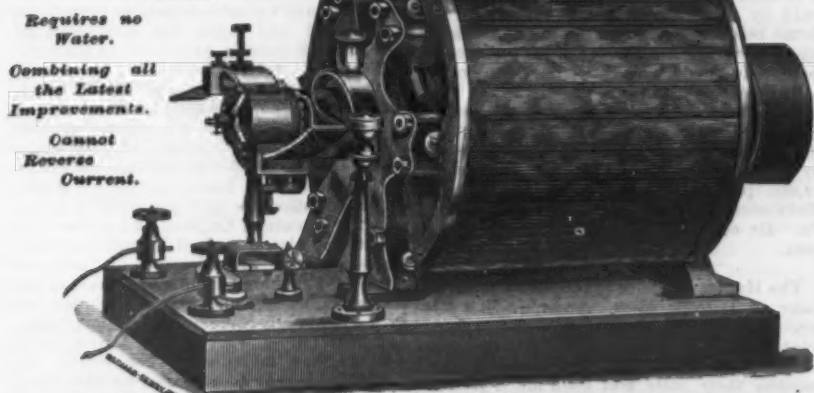
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We ask the special attention of the trade to our C. H. No. 1 Boiler Plates, which we manufacture expressly for the shells of Steam Boilers and stamp 50,000 pounds T. S. when desired. One hundred and sixteen tests of this iron, made during the last three years by the U. S. Inspectors of Steam Vessels, show an average tensile strength of 58,805 pounds to the sectional square inch, and an average reduction of area of the fractured section of 30% per centum. Our prices are as low as the production of a good article will admit of.

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Parallel, Sargent's.....ds 308-10 5
Parallel, Backus and Union.....ds 40 5
Parallel, Double Screw Leg.....ds 158-10 5
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Simpson's Adjustable.....ds 40 5
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Saw Filers, Reading.....ds 408-10 5
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Cowell Hand Vises.....ds 20 5
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Strass and Copper, new list, Jan. 18, 1884.....ds 20 5
Market, Bright and Annealed, Nos. 9 to 15.....ds 77-5
Market, Coppered.....ds 62-5
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Stone, Bright and Annealed No. 19 to 28.....ds 70 5
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Stone, Tinned, Tinned.....ds 67-5
Tinned Broom Wire.....ds 62-5
Broom Wire, Galvanized, Nos. 8 & 9.....ds 62-5
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Cox's genuine.....can 10 days, ds 60-5
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Gilbert Agricultural.....ds 75 5
Waters' Patent.....ds 30 5
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Waters' Patent Combination.....ds 40 5
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Leather dressed with this oil will not crack or rot, as heat, cold, water or gas has no effect on it. It will spread one-third further and last much longer than any oil for the same purpose. It never turns rancid; will keep in any climate. Belts may be run in water at one end and a hot room at the other, and still be soft, dry and pliable. Warranted not to start glue-laps or gum on belts or pulleys, and to keep the surface perfectly smooth.

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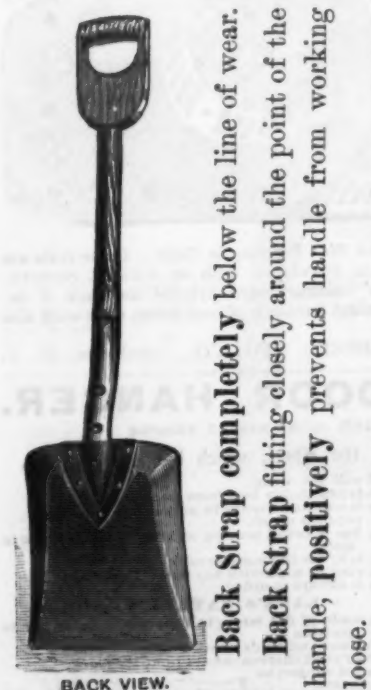
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WASHINGTON NEWS.

(From Our Regular Correspondent.)

WASHINGTON, D. C., September 24, 1884.
 It was stated in this correspondence some weeks ago that, the President having determined not to issue to Mr. Jarrett his commission as commissioner of labor statistics, to which office he was confirmed by the Senate, he would be likely to discover, when he came to make another selection, that under the existing statutes affecting the tenure and appointments to office he could not fill the place during the adjournment of Congress. This question has now been raised, and in such a shape that not only is the President's authority to make a new appointment at this time disputed, but when he undertakes to make the change at the proper time he will doubtless encounter some obstacles. As Mr. Jarrett was confirmed for his office, and as the President under existing statutes can only fill such vacancies, during adjournment of Congress, as may have occurred from death, resignation or inability to serve, he has no alternative but to have Mr. Jarrett die, resign or show that he is unfit before he can move. As the two first conditions do not exist, and as Mr. Jarrett's frank disparagement of President Arthur and laudation of Mr. Blaine was but the exercise of his inalienable right to his own opinions, it will be necessary for Mr. Hill, statistician of the Department of State, or some one else, to wait a while. It is very probable that Mr. Arthur will have some trouble to get the Senate to confirm a new appointment, as Mr. Jarrett would have the support of a number of Republican Senators, and the Democrats would naturally support him as against the President. It will be seen, therefore, that there is still a store of trouble in prospect on the labor commission.

THE WIRE-WOUND GUN.

It is reported at the navy yard that the 6-inch wire-wound gun will be ready for shipment to Annapolis by October 1, for testing. The tube was sent here from the Boston Iron Works, and, as far as the examination by officers of the navy is concerned, is entirely satisfactory.

NEW STEEL-MAKING PROCESSES.

In connection with a few general facts concerning Bessemer steel and manufactures therefrom, sent to the Department of State, is a reference to a modification of the Bessemer process by Alfred Davy, of Sheffield. The report says that "this apparatus will enable every iron founder to produce large or small quantities of steel for castings, or other purposes, at about the cost of cast iron, and of a quality superior to most crucible steel used for castings." It is also claimed "that steel may be produced by this apparatus of any temper of quality, except, perhaps, the highest class of tool steel, in large or small ingots, at \$20 or \$22 per ton." The cost of the apparatus is said to be small. The report further states that three plants have been ordered for the United States and the introduction is very general in England.

AMERICAN LOCOMOTIVES.

The minister of the Argentine Republic, resident at Washington, has received most satisfactory accounts of the American locomotives which were built for the Government of Buenos Ayres, and also large orders for more of the same class. The Belgian and English locomotives, in a trial of merit, stood no comparison with the American. The National Government, therefore, have discarded the former, and will avail itself of the progress made in this country in locomotive building.

AMENDMENTS TO THE CANADA TARIFF ACT.

Under the act of the Canadian Parliament, April 10, 1884, amending the "tariff of duties of customs," among the articles added to the list of free goods are iron or steel beams, sheets, plates, angles and knees for iron or composite ships or vessels, and steel for saws and straw cutters cut to shape, but not further manufactured. The following duties have been substituted for the old rates: Steel ingots, bars, sheets, under 1/4 inch thick, whole or cut to shape, but not further manufactured, and rolled round wire rods in coils, not elsewhere specified, \$3 per ton of 2000 pounds, and 10 per cent. ad valorem. Steel rolled round wire rods, under 1/2 inch in diameter, when imported by wire manufacturers for use in their factories, 5 per cent. ad valorem. Steel needles, viz., cylinder needles, hand frame needles and latch needles, 30 per cent. ad valorem. Iron, cast-iron forks, not handled nor ground or otherwise further manufactured, 10 per cent. ad valorem.

DECISIONS IN CUSTOMS CASES.

The following is a synopsis of sundry decisions rendered by the Treasury Department in customs cases during the past week: Fire bellows, composed of wood, leather and metal, metal being a prominent and important feature, are dutiable at 45 per cent. ad valorem, under Paragraph 216 (T. I., new), for articles composed wholly or in part of iron or any other metal. (Letter to collector of customs at Philadelphia.) Clock keys for winding clocks are dutiable at 30 per cent. ad valorem, under Paragraph 414 (T. I., new), for clocks and parts of clocks. (Letter to collector of customs at New York.) A natural combination of mica waste and soapstone, but ground, is dutiable at 10 per cent. ad valorem, under Paragraph 95 (T. I., new), for non-dutiable crude minerals, advanced in value or condition by grinding, &c. (Letter to collector of customs at Cleveland, Ohio.)

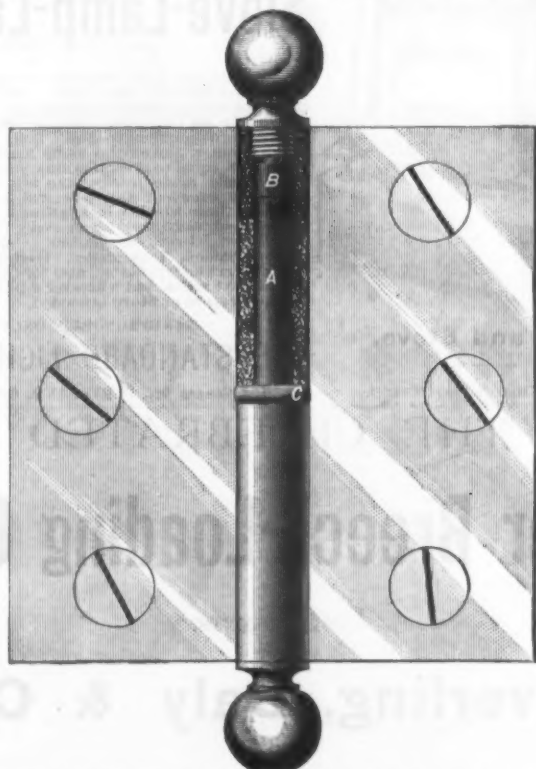
In the southwest part of Yorkshire, England, and therefore near the center of the largest mills of the world, hand weaving, it is said, is the chief source of subsistence of the entire population. In Skelmanthorpe, a village of from 3000 to 4000 inhabitants, domestic weaving is the chief occupation, and it has been fairly remunerative for the last six or seven years. A large stock company sell the products of this domestic industry, which it supports not alone by the advancing of money, but promotes by premiums. In times of large orders, when the home population cannot produce sufficient, weavers are drawn from Scotland. Specialties are the main products, especially seal-skins and shawls, which accounts for the prosperity of the industry.

HARDWARE NOVELTIES.

A Steel-Bushed Loose-Joint Butt.

The Yale & Towne Manufacturing Company, of Stamford, Conn., and 62 Reade street, New York, have lately put on the

and its general arrangement is easily understood from the illustration, it being very simple in its construction, having but four parts in all, including screws. It is claimed to use equally well files of almost any shape—flat, square, triangular, round, half-round,



Yale & Towne Mfg. Co.'s Double Steel-Bushed Loose-Joint Butt.

market a Loose-Joint Butt of improved construction which they designate as "double steel-bushed," and which we illustrate in the accompanying cut. The improvement consists in providing two bearing points in a loose-joint butt (which is as many as fast-joint butts of the usual sizes have), and also in facing both of these with steel, thus making its durability equal, if not superior, to that of the best fast-joint butt. The following is a description of its construction: A is a steel hinge-pin rigidly inserted in the lower leaf of the butt or hinge, and bearing at its upper end against the block B. C is a steel washer surrounding the pin A and interposed between the abutting faces of the two knuckles. B is a steel block inserted tightly in the pin-hole of the upper leaf of the hinge and bearing against a shoulder or collar projecting into the hole above it. The weight of the door attached to the upper leaf is thus borne jointly by the steel block B and washer, C, instead of by the latter only, as in other butts. All loose-joint butts manufactured hereafter by the Yale & Towne Manufacturing Company will embody this improvement.

Kitselman's Improved "Champion" Roller Skate.

This article, represented in the accompanying illustration, has recently been put on



Kitselman's Improved "Champion" Roller Skate.

the market by Kitelman Brothers, Ridgeville, Ind., by whom it is manufactured. Several improvements are embodied in it, and the manufacturers direct attention to its special features. By actual test they advise us that it will turn in about 24 inches, while their old skate would not turn in much short of 40 inches. They also direct special attention to the fact that this skate has two rubbers boxed in by metallic side flanges, and a vertical tongue connected with the axle hanger, extending down between the rubbers, making, it is claimed, a double or equal pressure on both of them at the same time in the rocking or lateral motion of the skate. The adjustable post is so constructed as to extend under the rubber plate, and is held in position by a set-screw, thus admitting of the removal of trunk and frame instantly, and permitting the rubber cushions to be replaced without removing the skate from the foot of the wearer. The point is also made that by this arrangement all the pressure is taken off of the set-screw, which was not the case in their former style. In the old style the rubber plate was almost parallel with the footboard, while in this it stands at an angle of about 40 degrees. Several other improvements have also been made, so that the manufacturers feel justified in placing this article on the market with confidence that it will meet a want in the trade. Peck & Snyder, we may add, are general Eastern agents for this skate, at 126-130 Nassau street, New York.

Rappleye's Saw Jointer.

The accompanying illustration represents Rappleye's Improved Saw Jointer, which is made by F. A. Rappleye, Farmer Village, N. Y. It is made of gray iron and japanned,

&c. The adjustable cap is to hold the file so that it cannot be turned off to one side. As this article is but 3 inches long, it occupies but little room in the tool-chest. Another point made in its favor is its cheapness, as it can be retailed for 25 cents and afford a good profit. Mr. Rappleye will soon have a



Rappleye's Saw Jointer.

larger size made on substantially the same principle for jointing cross-cut and mill saws, with which a long, flat file is to be used.

The "Perfection" Scale.

This article, which has recently been put on the market by the American Machine Company, Philadelphia, will be recognized



The "Perfection" Scale.

sembles, though the weighing mechanism is different. It will be perceived that the scale has self-acting weights, the operation of which can be easily understood from the cut, with the aid of the following description: In

the above cut 1, 2, 3 and 4 are the weights suspended on the bracket and held one above another, with regular intervals of space between them, and just above and in position to be acted upon by the weight-jack B B resting on the lever pivots. The arrangement is such that as goods are placed in the scoop the lever will turn, first raising the bottom weight off its seat A, and then adding the others one after another until the lever turns sufficiently to raise them all off their seats on the bracket, when they will be resting on the lever. The index finger is so arranged that it will move from one figure on the dial to the next at the precise time that such weight is balanced with goods and thus raised. Thus, in the cut, 1 pound placed in the scoop raises weight 1 off its seat A, and moves the index finger slowly up to the figure 1 on the dial. Should another pound now be added in the scoop it would raise weight 2 with the first and bring the index to the figure 2 on the dial, and so on. Attention is specially directed to the fact that in these weights the points at which they are supported and the points which are acted upon in raising them are in the same horizontal line, so that there is no binding to interfere with their free action. Intermediate or fractional weights are determined on the brass beam, as represented in the cut. The hood D, it will be observed, completely covers the weights, securing them in their position, so that they cannot fall off, in whatever position the scale may be turned, and also protecting them from dirt, &c. We need only add that the scale, as represented in the illustration, has part of the weight case removed, the works being completely concealed by a cover. The manufacturers direct special attention to the accuracy with which this scale is claimed to weigh, obviating overweight which in some common scales is requisite to balance the scale. This article is made in the grocers' and confectioners' styles, and also with a marble slab in place of a scoop for butchers' use, and with a round pan for druggists. The five different sizes weigh from 1/4, 1/2 or 1 ounce to 2, 5, 11, 22 or 55 pounds.

Recent Boiler Explosions.

The new and immense cotton compress of the Georgia Central Railroad and Banking Company, at Enfield, Ala., was destroyed on the 15th inst. by an explosion of the boiler, which was followed by a destructive conflagration. A number of lives were lost, and many persons were seriously injured. Three hundred bales of cotton were destroyed with the warehouse. Nine cars loaded with cotton and standing on the track west of the compress were also consumed. The total loss is about \$200,000, partially covered by insurance. Every building in the city was shaken to its foundation by the explosion, and the wildest excitement prevailed. One piece of the boiler weighing 4 tons was thrown 270 yards.

A terrific boiler explosion occurred, on the 16th inst., at the Lykens Valley Colliery, Pa., owned by the Pennsylvania Railroad Company. The explosion occurred a little after 5 o'clock, and was heard for many miles. Had it taken place a half hour later the loss of life would undoubtedly have been great. The explosion was caused by a defective boiler. Four boilers exploded together, throwing iron and timbers in every direction for several hundred yards. The explosion has caused the total suspension of work at the Lykens Valley Colliery for several days. Three men were somewhat painfully injured by being bruised and scalded, and a boy was mortally hurt.

Signor Gabelli, civil engineer, has published in a recent official report his ideas on uniting the Island of Sicily with the Italian Peninsula by means of a tunnel. The first thing to be considered, according to Signor Gabelli, is the conformation of the sea bottom at the straits, and he states that it is beyond all doubt that in a southeasterly and northerly westerly course, starting from Pizzo, on the coast of Calabria, and ending at Sant' Agata, on that of Sicily, exists a submarine chain of mountains separating the basin of the Mediterranean from that of the Adriatic. The sides of these mountains are very steep; in fact, while the crest of this ridge is only 110 meters under the surface of the sea, at 2 kg. away from it the depth attains 260 meters; in front of Messina it is 340 meters; and in the offing of Reggio 657 meters. The course of the contemplated tunnel is therefore clearly established from these hydrographical conditions. It only remains to be seen whether the nature of the soil is sufficiently solid and compact for the purposes required. It was necessary to ascertain the exact formation of the rock to be pierced,

Probably every man, says the *Locomotive*, who owns or has run a boiler has experienced a vast deal of trouble with the cast-iron mouth-pieces around the furnace doors. These pieces invariably warp, crack and burn out in a short time, and the fire-brick lining falls down, the cast-iron front becomes burned, and, where the boilers are set with the flush front setting, the portion of the shell which projects beyond the front tube sheet gets overheated, which generally results in its fracture, and in many cases the longitudinal seam where the head is attached to the shell is so severely strained that it begins to leak, and sometimes this leakage is very difficult to stop, owing to the joint being permanently strained. This warping and burning away of these castings may be prevented by simply slitting them back from the edge for about one-half their depth. The slots should be from $\frac{1}{2}$ to $\frac{3}{4}$ inch in width, and may be from 8 to 12 inches apart over the furnace door. This width is necessary, as they close up gradually under the influence of the intense furnace heat.

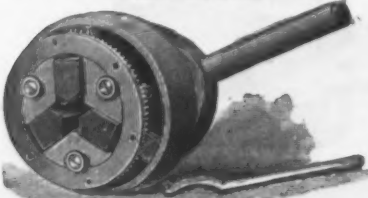
To provide storage for the stock of silver at Washington an additional vault has been constructed in the basement of the Treasury Department, directly underneath the cash-room. This vault is 31 feet 4 inches wide, 55 feet 4 inches long and 9 feet 4 inches high. It will hold 50,000,000 silver dollars, which represents in bulk 1790 tons. The walls, ceilings and floor are constructed of three chilled-iron and two steel plates riveted together, thus making the metal case which forms the defenses of the vault over 2 inches in thickness. The foundation of the vault rests upon the earth, and the iron and steel flooring is laid upon 12 inches of hydraulic cement to guard against entrance by means of a tunnel. The two doors by which entrance is obtained are massive and very strongly constructed, one key being kept by Treasurer Wyman and the other by Cashier Whepley.

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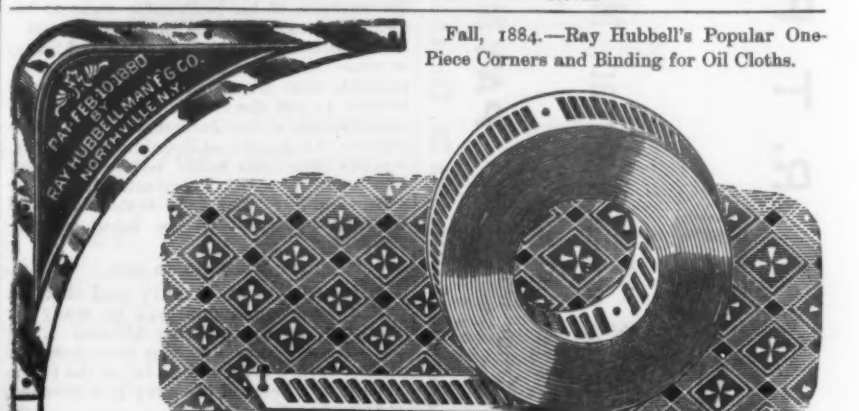
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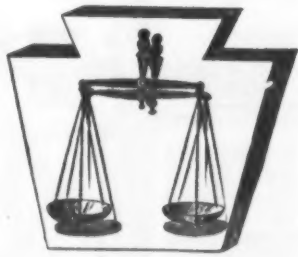
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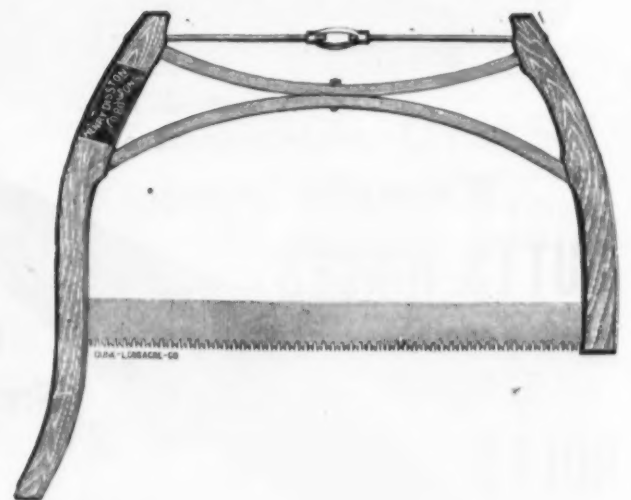
"CLIMAX," OR No. 60.
With Regular No. 6 Blade.



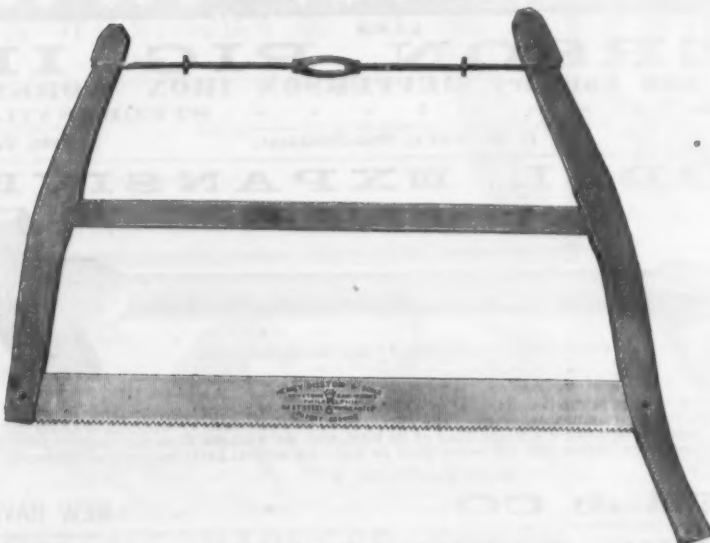
"DISSTON'S" No. 6,
With Regular No. 6 Blade, furnished either with
Straight or Clipper Rods.



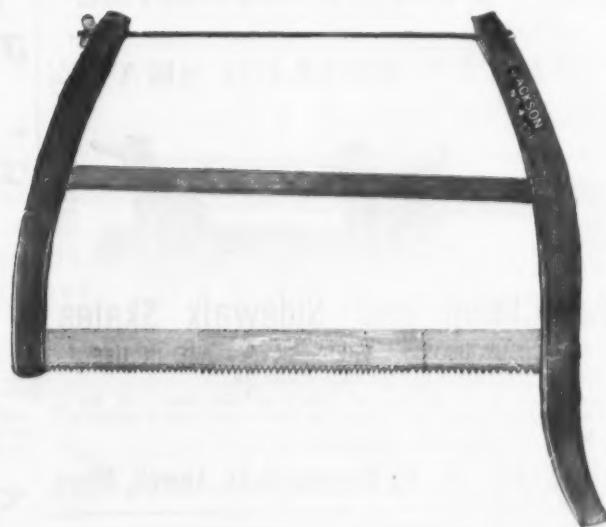
"BRACE FRAME," No. 80.
With No. 77 Blade.



"BOSTON" FRAME,
With Regular No. 6 Blade.



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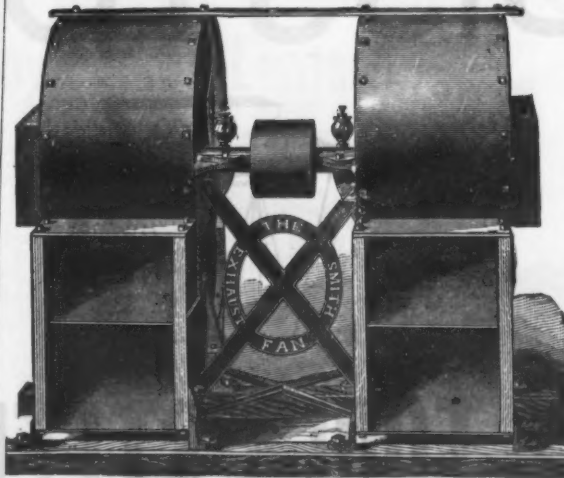
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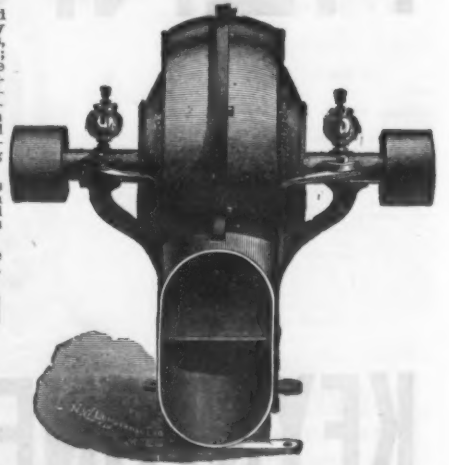
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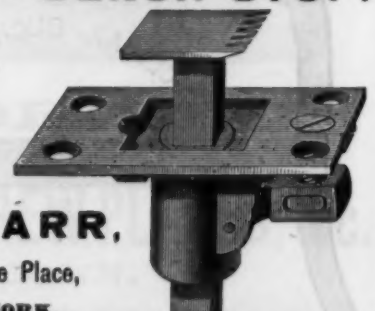
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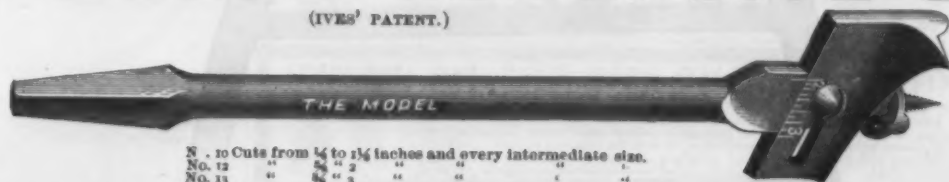
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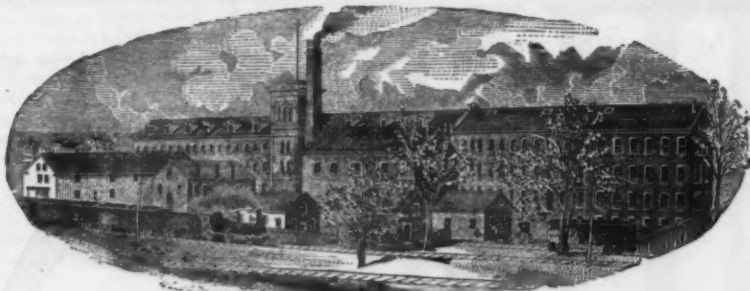


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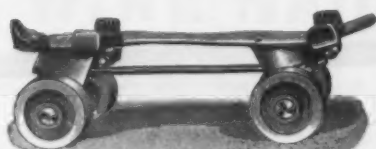
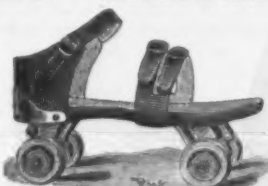
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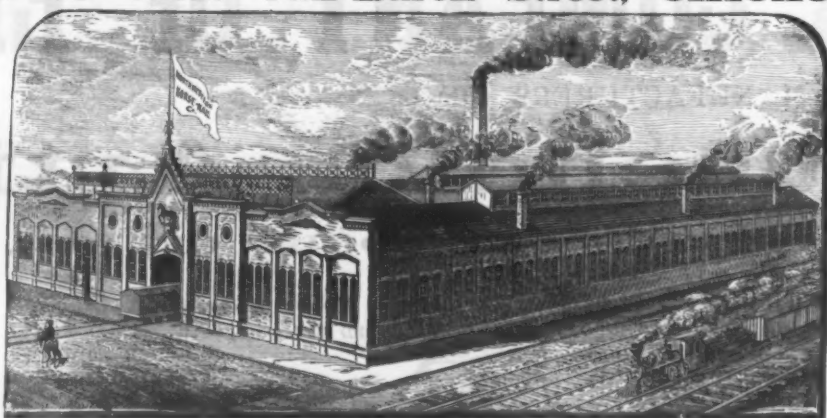
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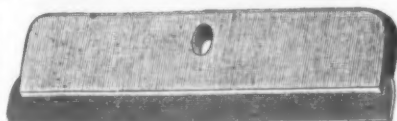


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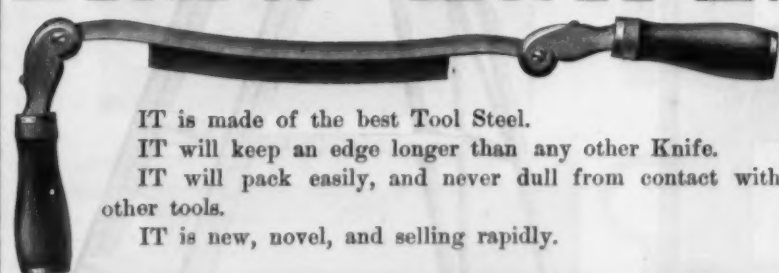
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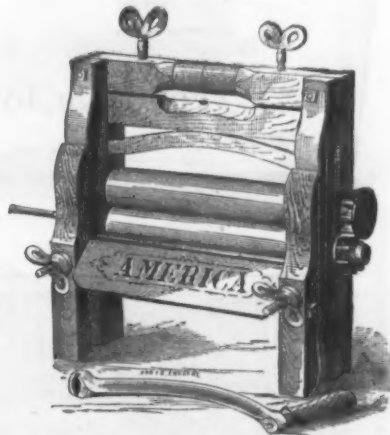
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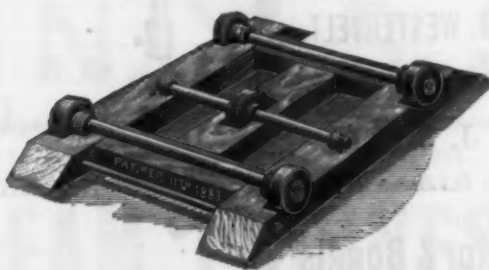
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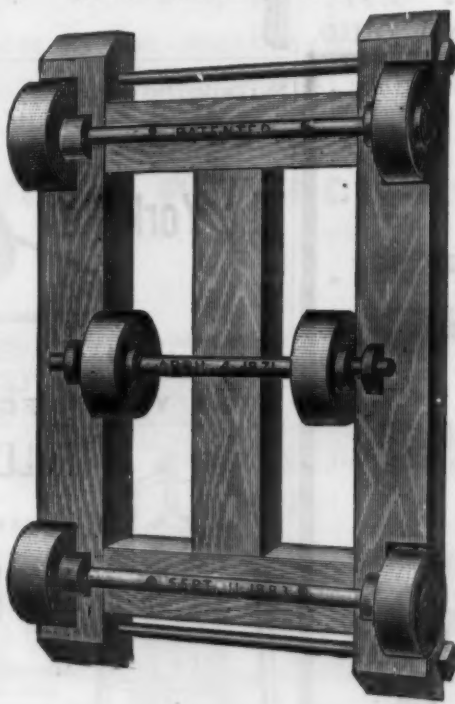
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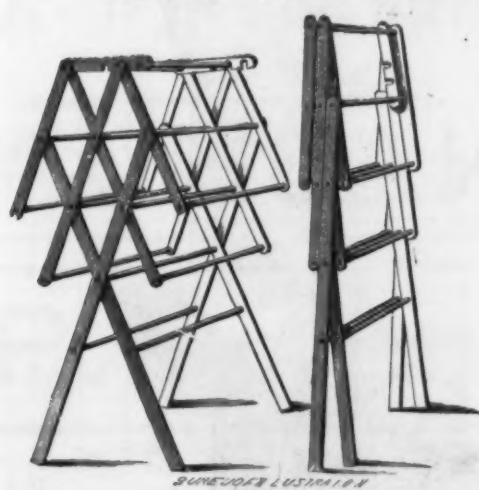
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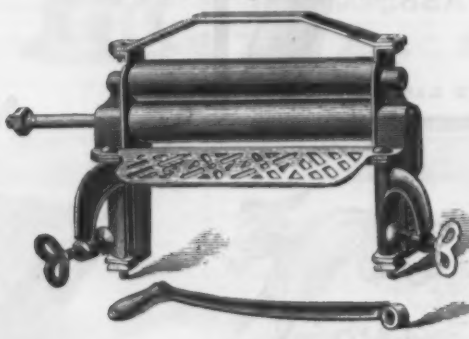
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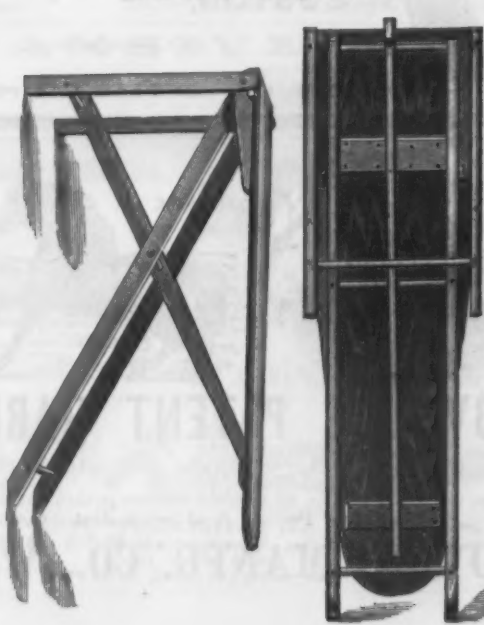
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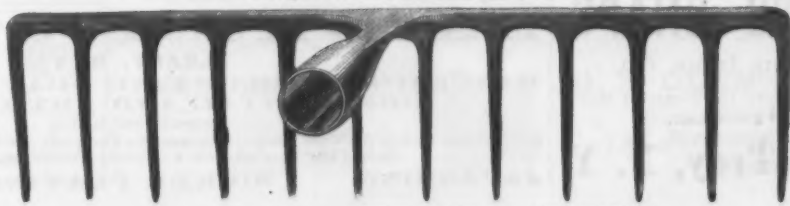
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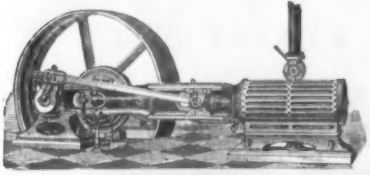
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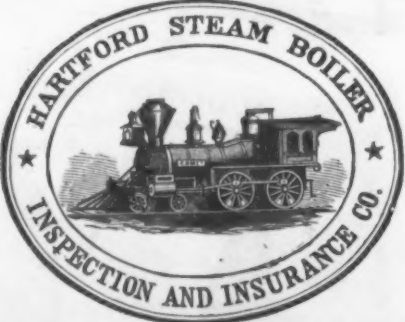


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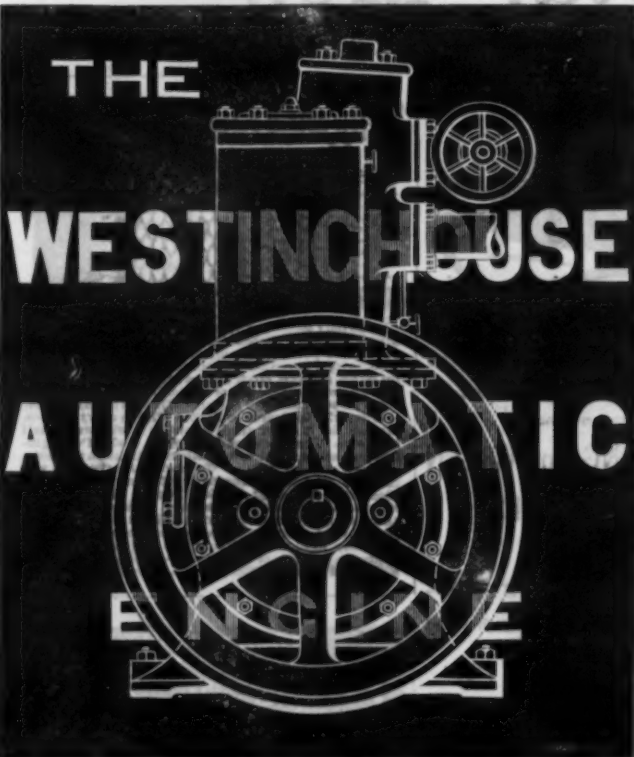
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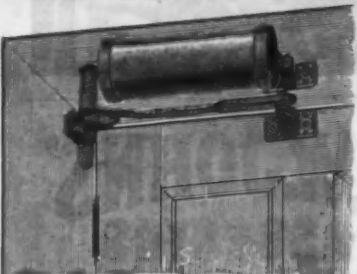
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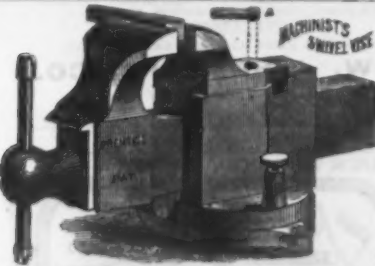
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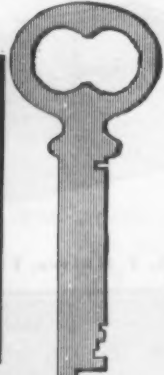
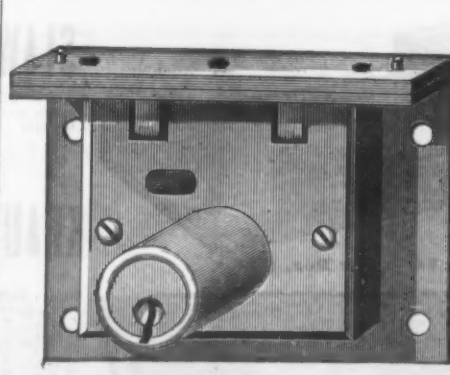
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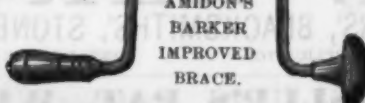
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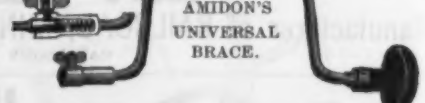
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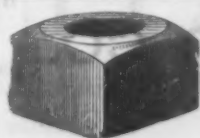
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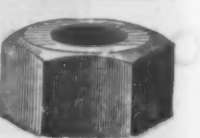
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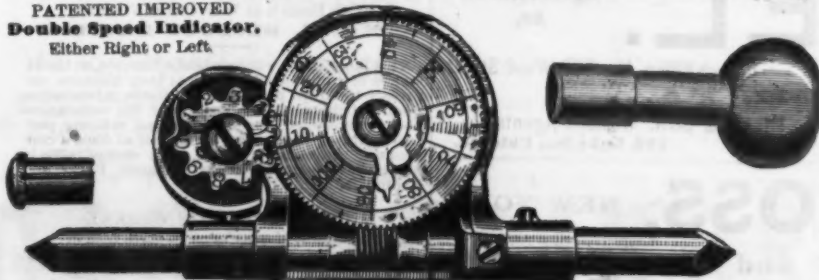
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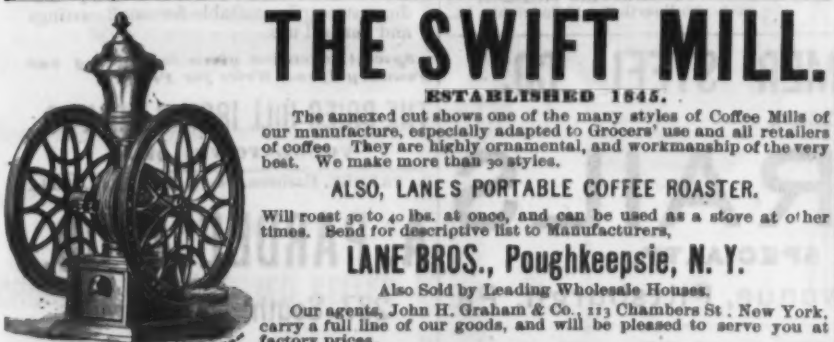
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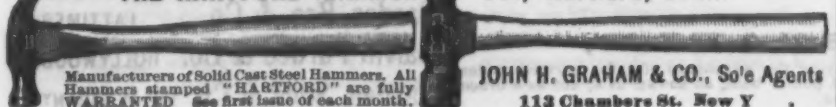
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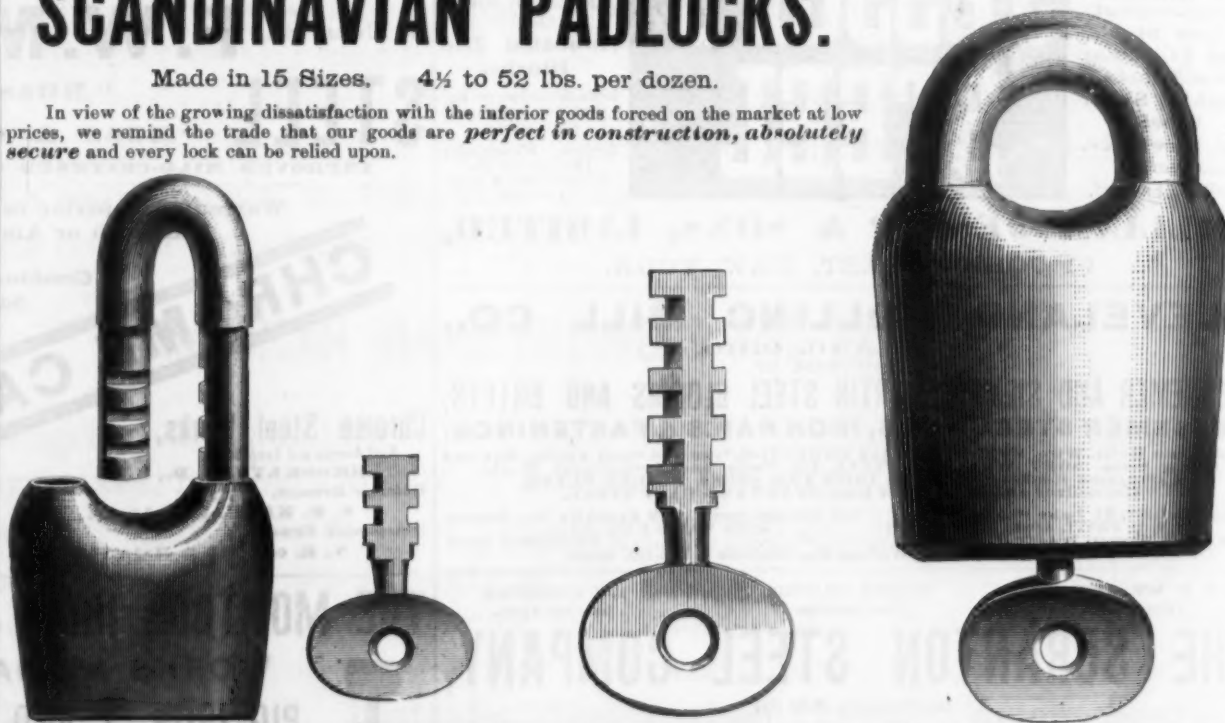
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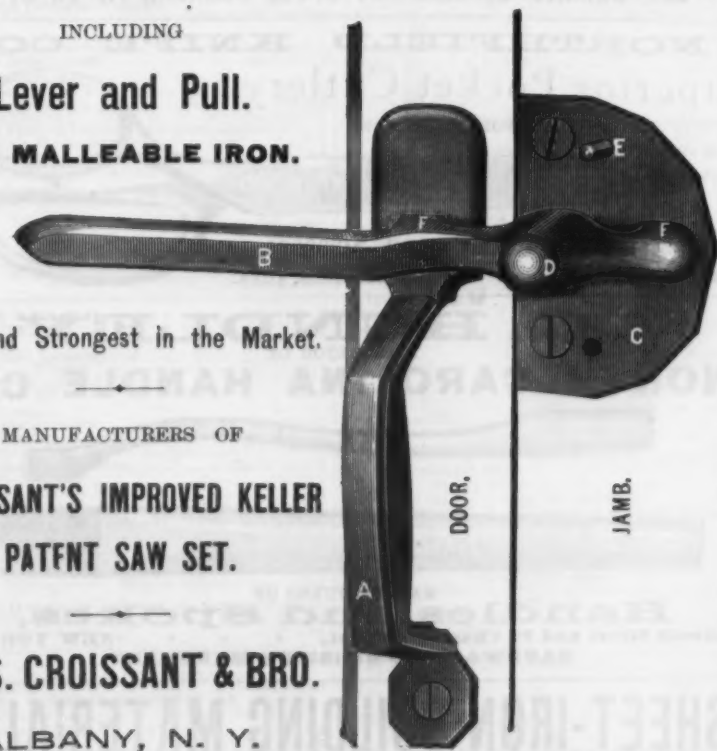
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**LIST OF
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IN ORDER to meet a decided and constantly growing want, as made known and emphasized by almost daily inquiries asking for names and addresses of makers of iron, tools, tin plates, hardware, steel, machinery, oils, varnishes, japans, &c., &c., it has been decided to include in the

Ironmonger Diary and Text Book for 1885

(now in course of preparation) as complete a list as possible of trade-marks, brands, specialties, &c., made and in use in all parts of the world, similar to that contained in our Diary for 1884.

This list excludes all ordinary trade announcements proper, and is strictly confined to trade-marks and brands, whether blocks, electros or other appliances for illustrations, with just sufficient letterpress to describe the kind of article to which the mark, &c., is applied, and the names and addresses of the owners or lawful users. For the sake of uniformity in space and charges, each mark occupies a space measuring 1 inch deep by 1½ inches wide, and the uniform charge is \$2.50 (10s.) only for each such space, payable in advance unless we have already an open advertising account with the firm giving the order.

The advertisements so inserted are printed on colored paper, classified under suitable heads, and so arranged as to make them both effective and useful.

Blocks or electros, &c., of marks or brands which may be too large are reduced by us at cost price (roughly about \$1 each) to the requisite size on receipt of remittance along with the cash for the cost of advertisement.

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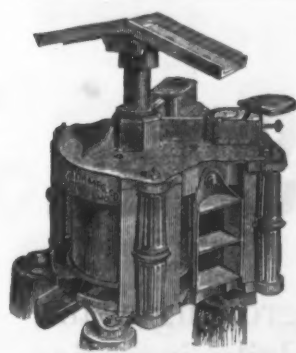
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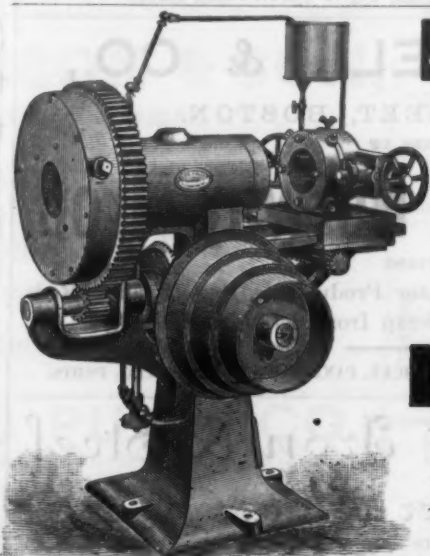
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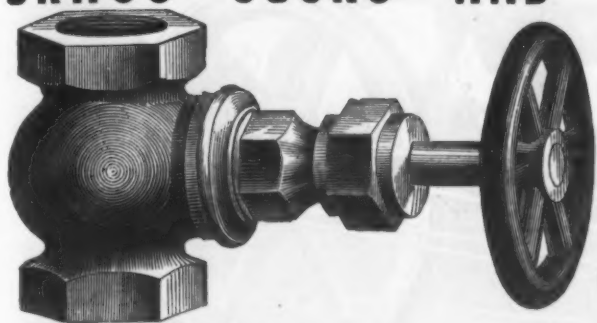
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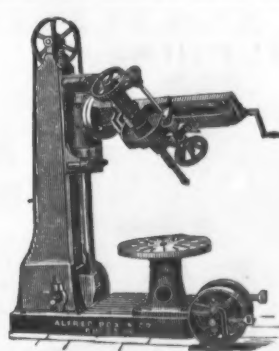
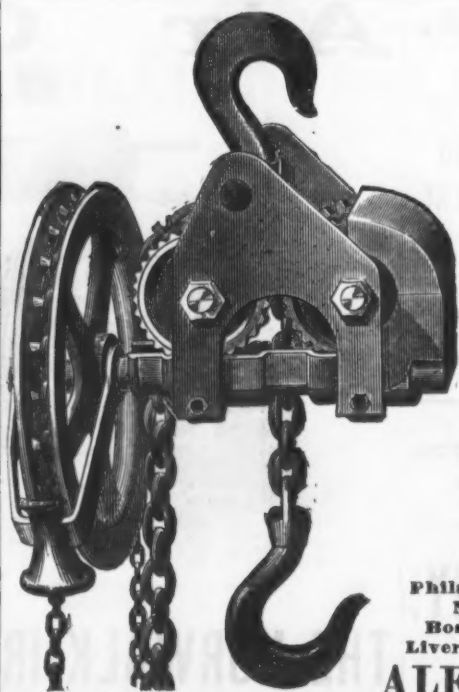
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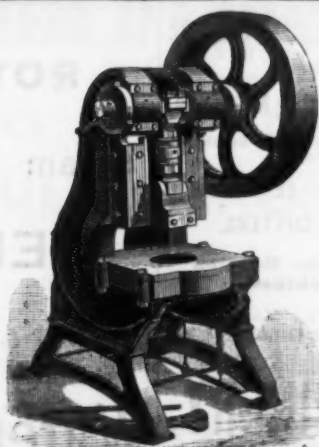
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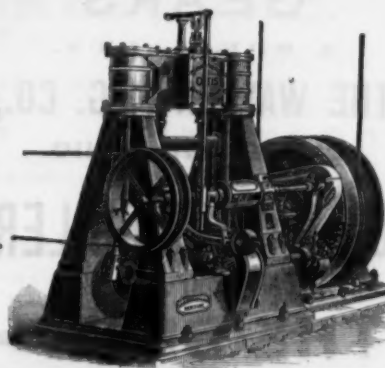
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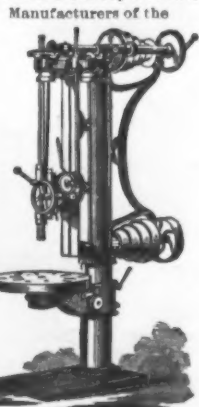
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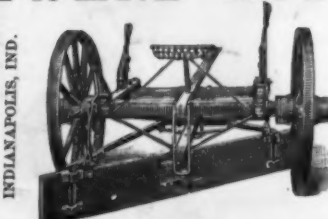
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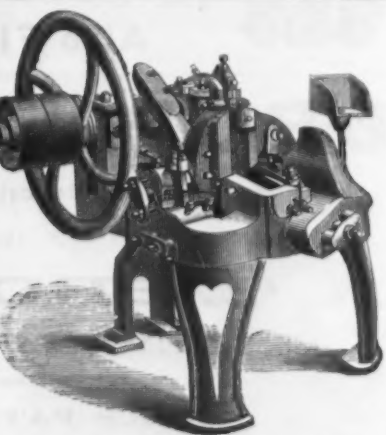
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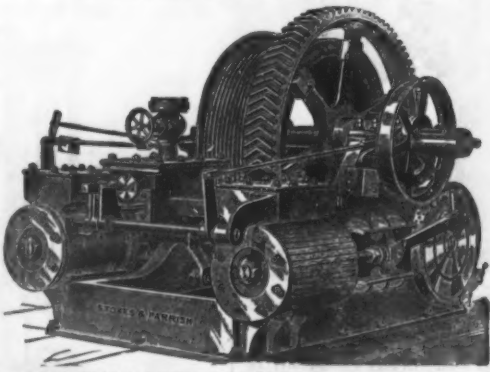
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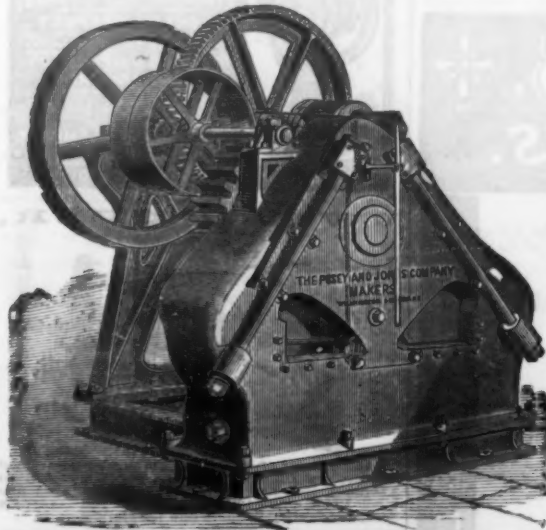
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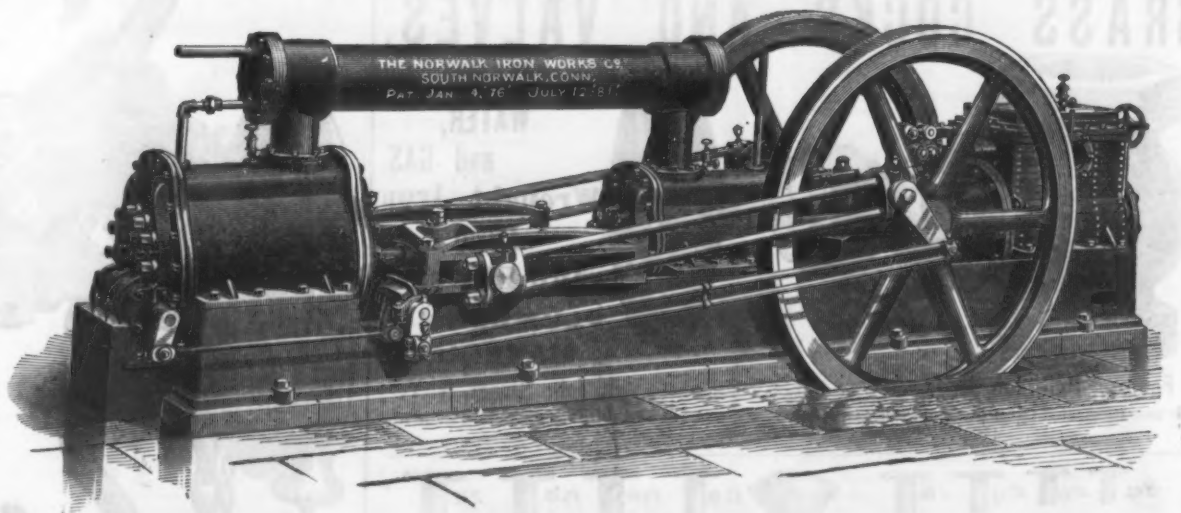
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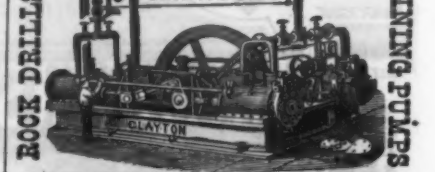
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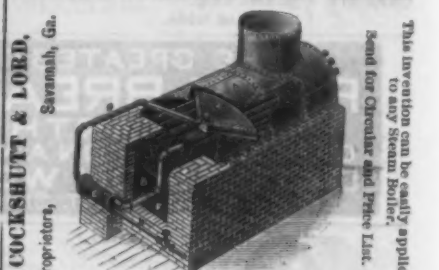
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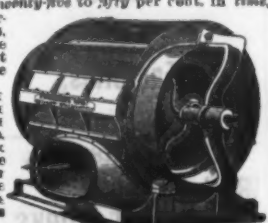
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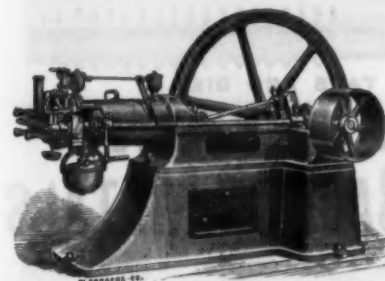
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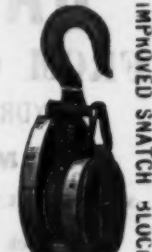
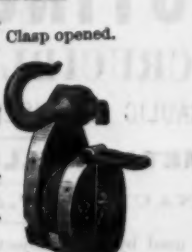
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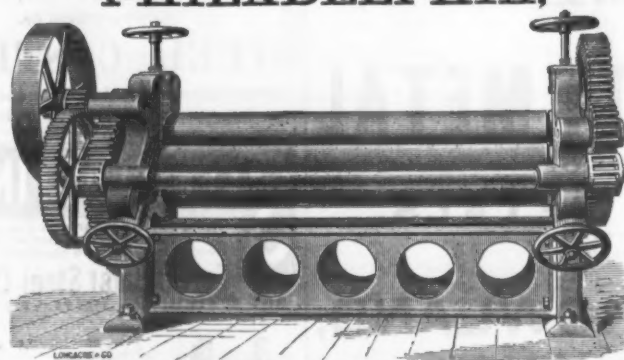
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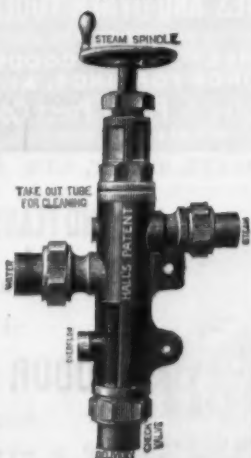
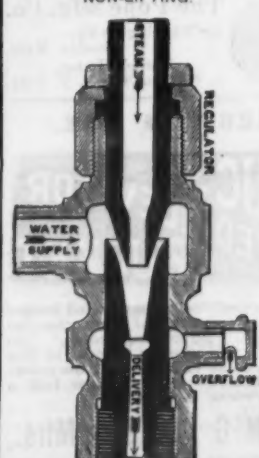
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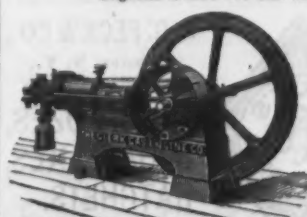
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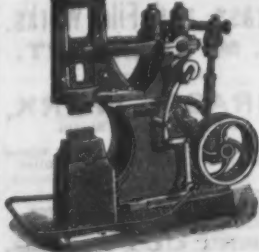


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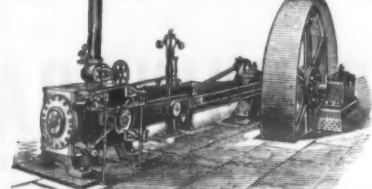
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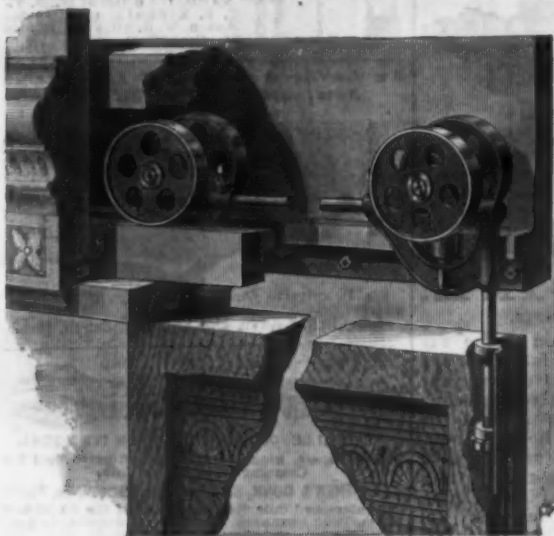
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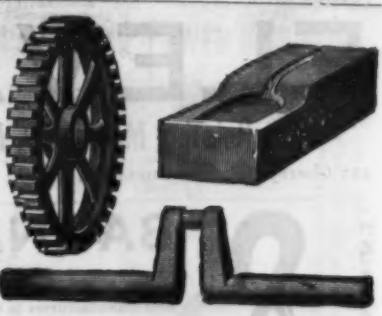
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